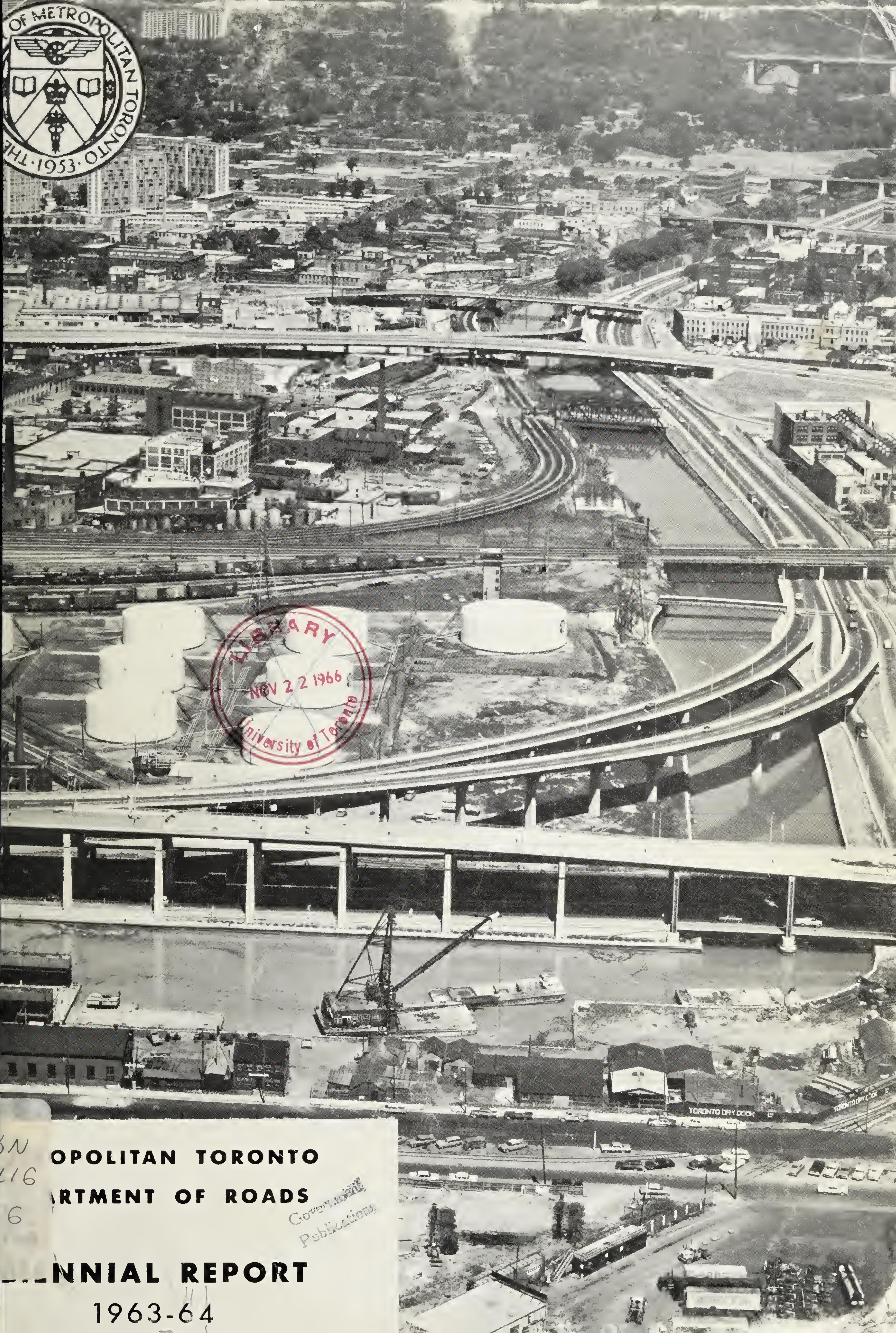

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1963-64

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GEORGE O. GRANT
B.Sc., M.E., P. Eng.
COMMISSIONER OF ROADS

DEPARTMENT OF ROADS

75 EGLINTON AVENUE EAST HU. 1-6171
TORONTO 12, September 1, 1965.

Government
Publications

William R. Allen, Esq., Q.C., Chairman,
and Members of the Council of
The Municipality of Metropolitan Toronto.

Ladies and Gentlemen:-

I forward herewith, for your information, Biennial Report of the Department of Roads of The Municipality of Metropolitan Toronto. It covers the operations of the Department for the years 1963 and 1964.

Yours very truly,

G. O. Grant

ET

Commissioner of Roads.

Moving To
NEW CITY HALL
December, 1965.

OFFICIAL OPENING CEREMONY
OF CONFLUENCE OF
THE FREDERICK G. GARDINER EXPRESSWAY
AND THE DON VALLEY PARKWAY

November 6, 1964

Frederick G. Gardiner, Q.C., LL.D.	The Honourable John P. Robarts, Q.C., LL.D., Prime Minister of Ontario	William R. Allen, Q.C., Chairman, Metropolitan Council

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Committees of Council - The two Committees of Council pertinent to the Department of Roads are the Executive Committee and the Transportation Committee. Their membership for the two years embraced by this report was as follows:-

EXECUTIVE COMMITTEE

1963	1964
W. R. Allen, Q.C. (Chairman)	W. R. Allen, Q.C. (Chairman)
A. M. Campbell	A. M. Campbell
Miss T. Davidson	W. Dennison
P. G. Givens, Q.C.	P. G. Givens, Q.C.
N. C. Goodhead	A. A. Lamport
A. A. Lamport	J. Mould
* D. D. Summerville	Mrs. B. Nealson
** W. Dennison	

TRANSPORTATION COMMITTEE

1963	1964
W. L. Archer, Q.C. (Chairman)	D. Rotenberg (Chairman)
G. W. Bull	A. M. Campbell
A. M. Campbell	Miss T. Davidson
A. A. Lamport	R. R. Horkins
Mrs. B. Nealson	A. A. Lamport
* D. D. Summerville	Mrs. B. Nealson

The Metropolitan Chairman is ex-officio a member of the Transportation Committee.

* Deceased November 19, 1963
** Appointed vice D. D. Summerville

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Cover: Confluence of Frederick G. Gardiner Expressway
and Don Valley Parkway.

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Photo Credits: Of Mr. Gardiner - Toronto Star,
Lockwood Survey Corporation, Panda Associates,
Alexandra Studio.

- FOREWORD -

As 1964 ended, the statistical record of the Metropolitan Department of Roads indicated completion of the following projects in the eleven-year period since its organization on January 1, 1954:-

Structures:		
Railway Grade Separations - New	27	
- do. - - Reconstructed	3	
Other Bridges	91	121
New Roads		30.97 miles
Existing Roads Reconstructed		17.04 "
Pavement Widenings		62.21 "
Resurfacing of Pavements		135.51 "
Intersectional Improvements		196
Bridges Repaired (major works)		12
Bridges Widened		3

Capital costs during this period were as follows:-

		$
1954	-	4,120,164
1955	-	10,231,814
1956	-	15,567,954
1957	-	15,888,326
1958	-	13,491,954
1959	-	13,858,094
1960	-	27,216,097
1961	-	23,950,330
1962	-	29,263,276
1963	-	39,797,854
1964	-	31,564,525

Figures pertinent to the foregoing are -

	Jan. 1, 1954	Dec. 31, 1964
Population of Metropolitan Toronto	1,174,002	1,741,411
Vehicle Registration, Metropolitan Toronto	289,814	639,000
Persons per Vehicle	4.05	2.73

GARDINER
EXPRESSWAY
WEST

- CAPITAL WORKS UNDERTAKEN -

Frederick G. Gardiner Expressway - A vision of 1953 became a reality on November 6, 1964, with the official opening of a section of the Frederick G. Gardiner Expressway between York Street and the Don River and its confluence with the Don Valley Parkway by The Honourable John P. Robarts, Q.C., LL.D., Prime Minister of the Province of Ontario.

The connection of these two roads, the first of the proposed Metropolitan Toronto Expressway System, permits a motorist to travel unhampered by traffic signals and intersecting streets from the Queen Elizabeth Way at the Humber River to the Interchange between Lawrence Avenue and the Don Valley Parkway in the northerly part of the Metropolitan area, a distance of 15 miles.

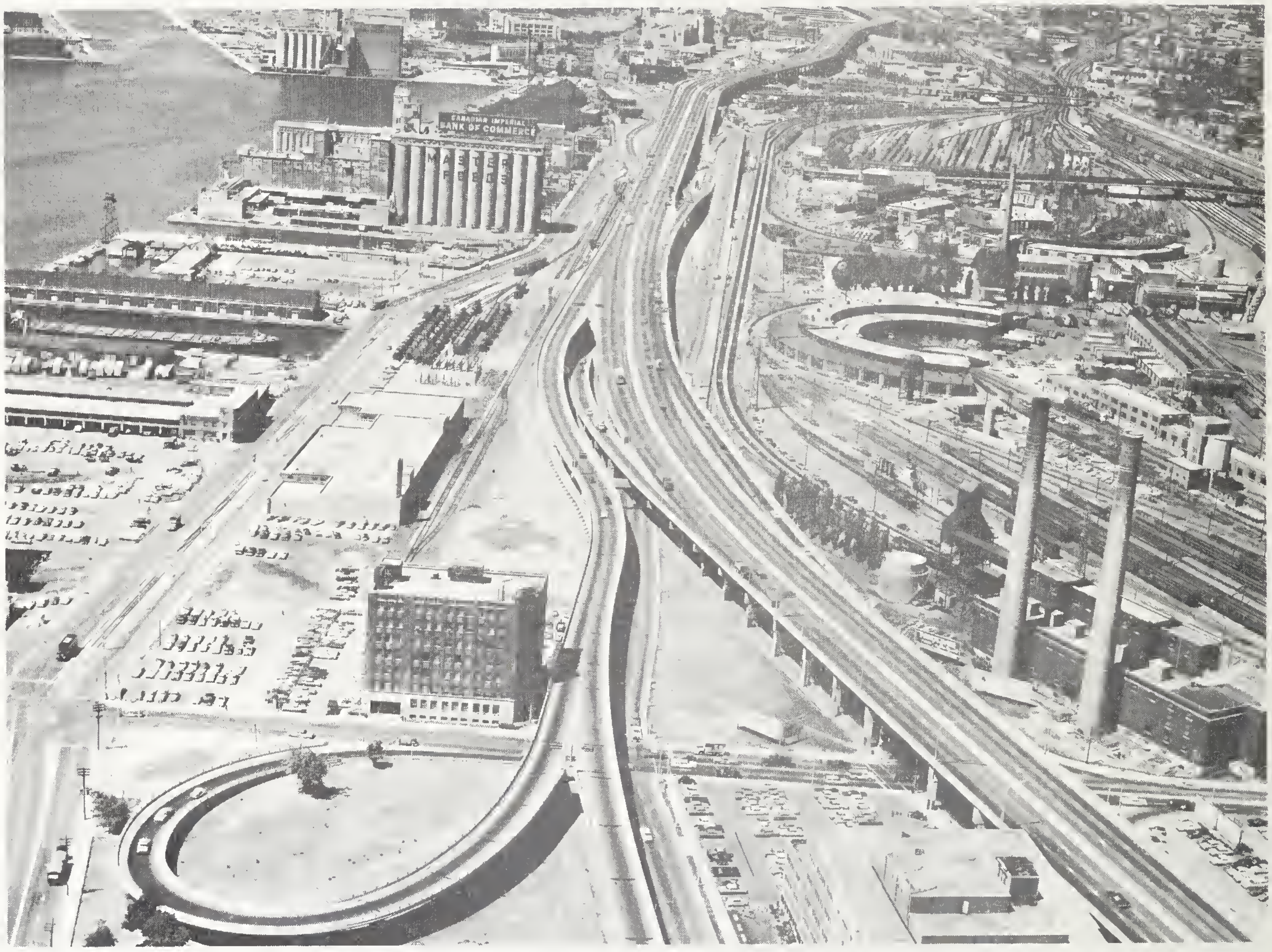
The final one mile section of the Expressway between the Don River and Leslie Street is now under construction and is scheduled to be opened by the Summer of 1966.

Construction of the penultimate section of the Expressway, the 2/3-mile stretch between Jarvis and York Streets through the heart of the City, established a record of some sort. The target date for its completion was July, 1965, but this was cut back by eight months to the date of the official opening due to all-round acceleration that tested the resources and ingenuity of the contractor. Clearing operations on the site commenced early in July, 1963.

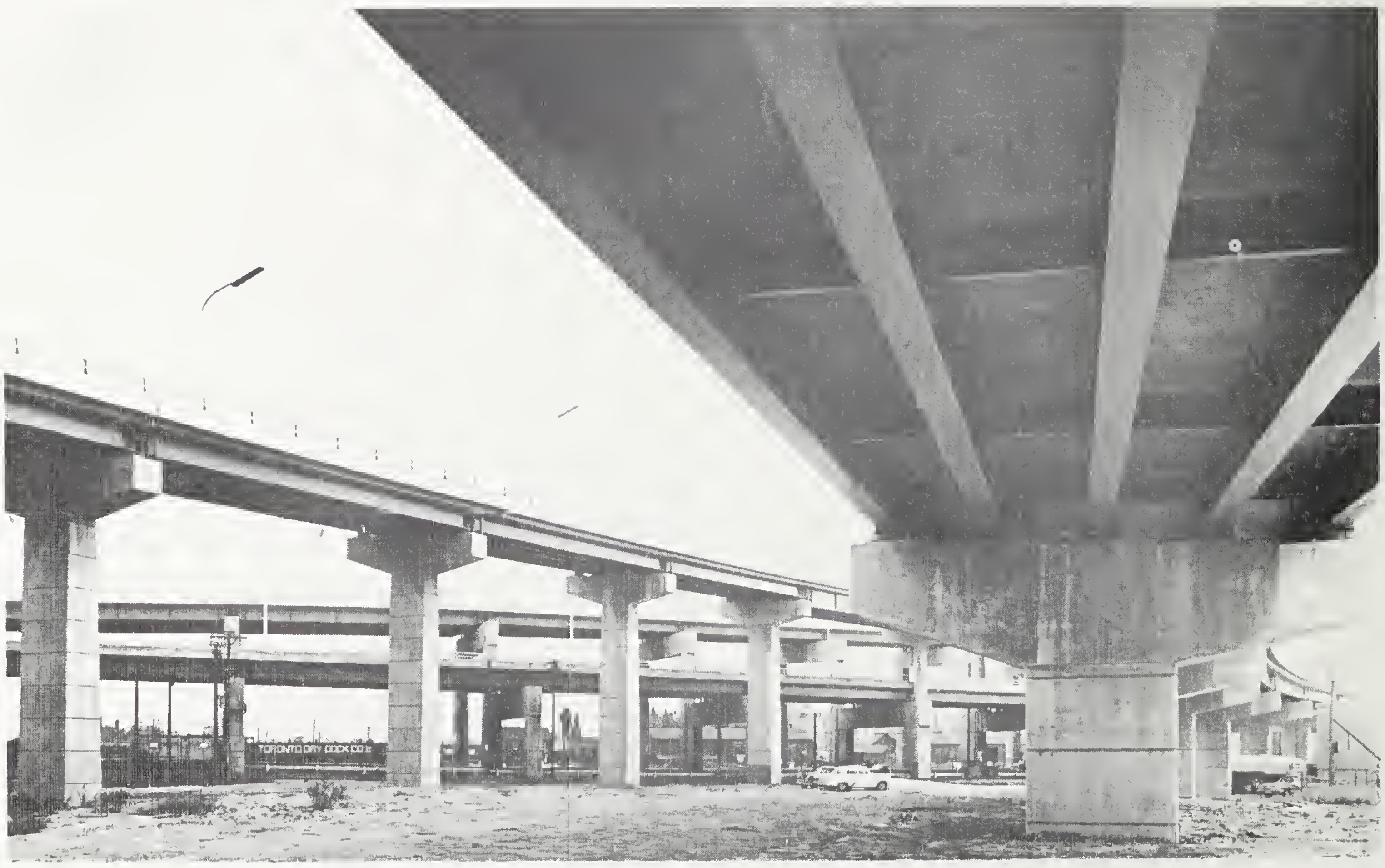
The contract called for an all-concrete structure embodying several unusual design features intended to blend with the projected development of the downtown area.

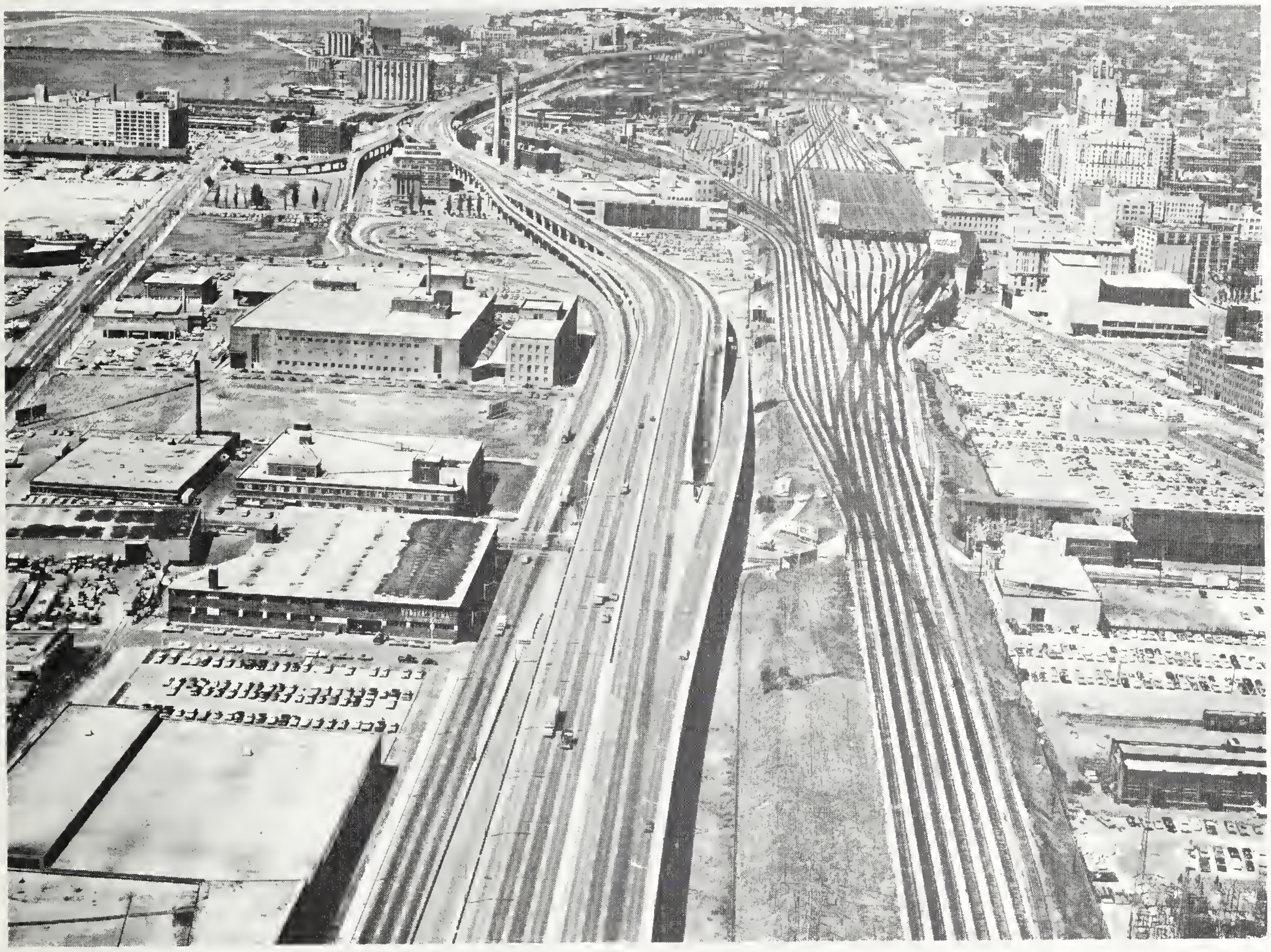
Pre-stressed concrete beams were used for the first time on the Expressway as the main part of the roadway deck. Concrete columns supporting the deck are tapered and six-sided rather than square, and the transverse girders between columns are arched, presenting an aesthetic appearance to those driving the west-bound lane of Lake Shore Boulevard which runs beneath it.

Focal point of the speed-up was establishment of a pre-stress casting yard located a short distance from the site. Altogether, over 15 miles of concrete beams were pre-stressed, poured, steam-cured and set at the yard.

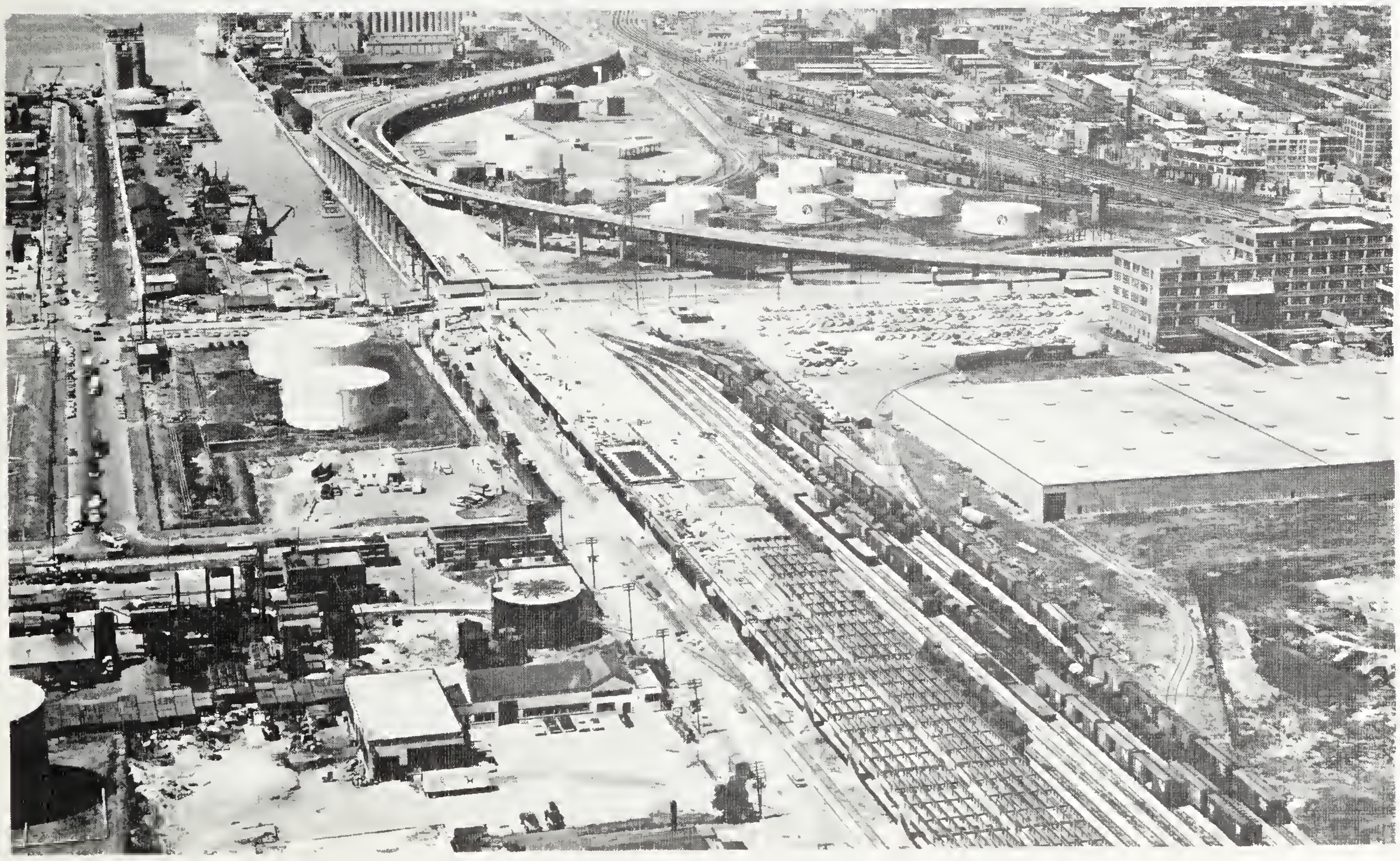


FREDERICK G. GARDINER EXPRESSWAY:
Upper - West of Yonge Street
Lower - Ramp Structures at Don Valley Parkway





Upper - East of Yonge Street
Lower - Final Section to Leslie Street



This section is located on land fill reclaimed from Lake Ontario, with the water table rising to within 6 or 7 feet of the surface and bedrock lying a further 20 to 25 feet down. Very loose fine sand fill and spongy soil meant it was virtually impossible to anchor an elevated structure without driving piling to bedrock. In some excavations it was found that the ground was pitted with man-made obstructions, and shovels uncovered massive old wharves, building foundations and barges.

The section previously placed in operation was from Spadina Avenue to York Street. Here, the west-bound lanes were opened on December 3, 1962, and the east-bound on September 30, 1963.

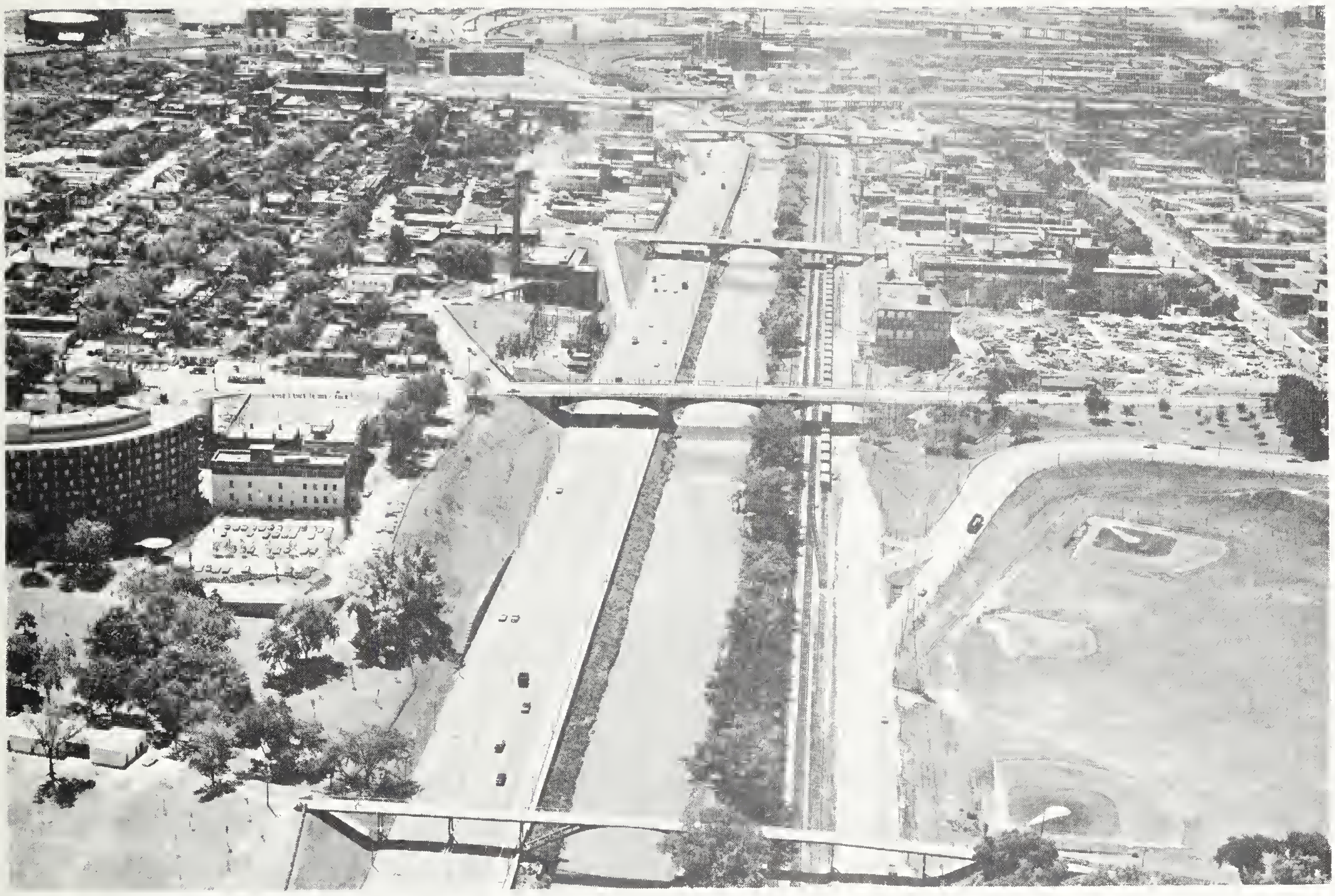
When completed to Leslie Street, the Expressway will extend a distance of eight miles with its total cost estimated at $103,500,000. Three miles of this is at grade at an average of $7,000,000 a mile and the five miles of elevated structure will cost $16,500,000 a mile.

Acquisition of the right-of-way will approximate $32,500,000 and the remaining expenditure of $71,000,000 will represent engineering, construction and utility relocation costs.

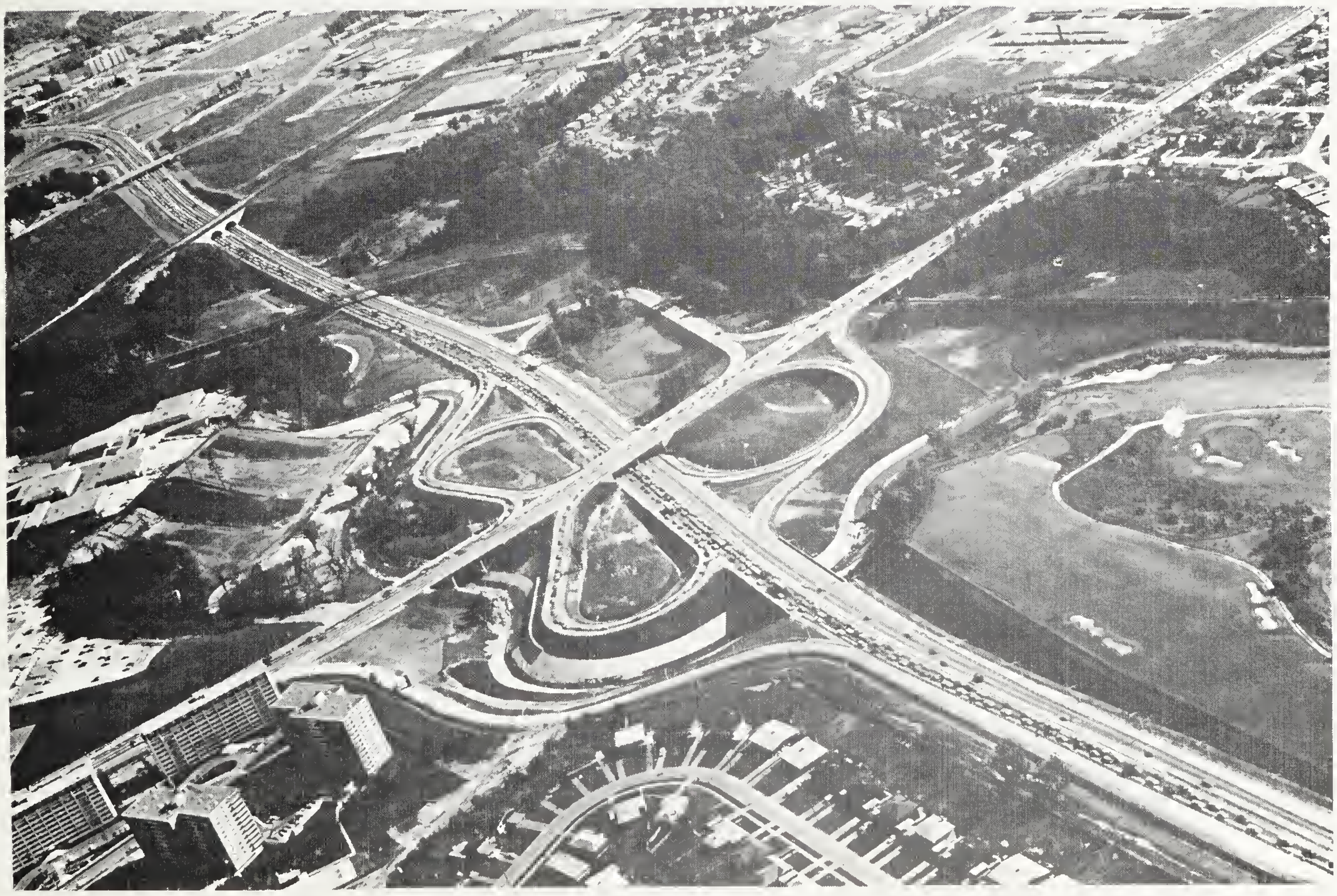
The Expressway is designed for a maximum of 100,000 cars a day. At rush hours now it reaches a peak of 1,800 cars per lane per hour. It is the first controlled-access urban freeway undertaken and opened to traffic in Canada.

Don Valley Parkway - The stretch of the Don Valley Parkway from the Frederick G. Gardiner Expressway to Bloor Street, which was also formally opened on November 6, 1964, following a two-year construction period, linked the two sections previously placed in operation and extending to Lawrence Avenue.

The elevation of this section was raised 5 feet above high flood level. To attain this, a steel sheet piling retaining wall was driven along the river bank and filled with slag to reduce the deck load on the piling. Installation of the sheet pile wall was complicated by the fact that the Don River in the past had eroded a meandering channel and there was considerable uneveness in the bedrock profile.



Don Valley Parkway, at its Southern Extremity and at Lawrence Avenue.



On October 30, 1963, evening rush-hour traffic journeyed the second section of the Parkway, from Eglinton Avenue to Lawrence Avenue, for the first time. Construction covered a 28-month period and included four bridge structures, a 2/3-mile river diversion and concrete channel lining.

Prominent amongst the bridge structures was the twin-barrel arch at the C.P.R. Its construction required that the railway tracks be detoured to the south, 60,000 cubic yards of earth moved, and the area over the arches backfilled to a depth of 20 feet to meet the railway grade.

The road base of this section was constructed of a material found on the site, which was a heavy clay of glacial origin. In order to place the material to the required 95% compaction, it was necessary to spread it out and disc it with an ordinary farm disc for drying.

The Don Valley Parkway is unique among urban expressways because of the utilization of an existing undeveloped river valley for its right-of-way. Very little property damage resulted and less than forty houses were affected, which, in itself, is a significant fact in a project of this magnitude.

A great economy also resulted because most railroads and major streets cross the valley on high-level structures, under which the Parkway passes with ease. In any other location but a valley, new grade separation structures would have had to be constructed, which would have increased the cost by some millions of dollars.

In four locations the River was diverted to preclude the erection of bridges. These diversions shortened the river considerably, but, with the vertical fall remaining unchanged, it was necessary to reduce the velocity of the river by the installation of check dams.

Going out for tender early in 1965, will be the section of the Parkway between Lawrence Avenue and the Macdonald-Cartier Freeway. Construction of the major interchange of the Parkway and the Freeway, which will be a joint venture between the Department of Highways and Metropolitan Toronto, will be coincidentally undertaken.

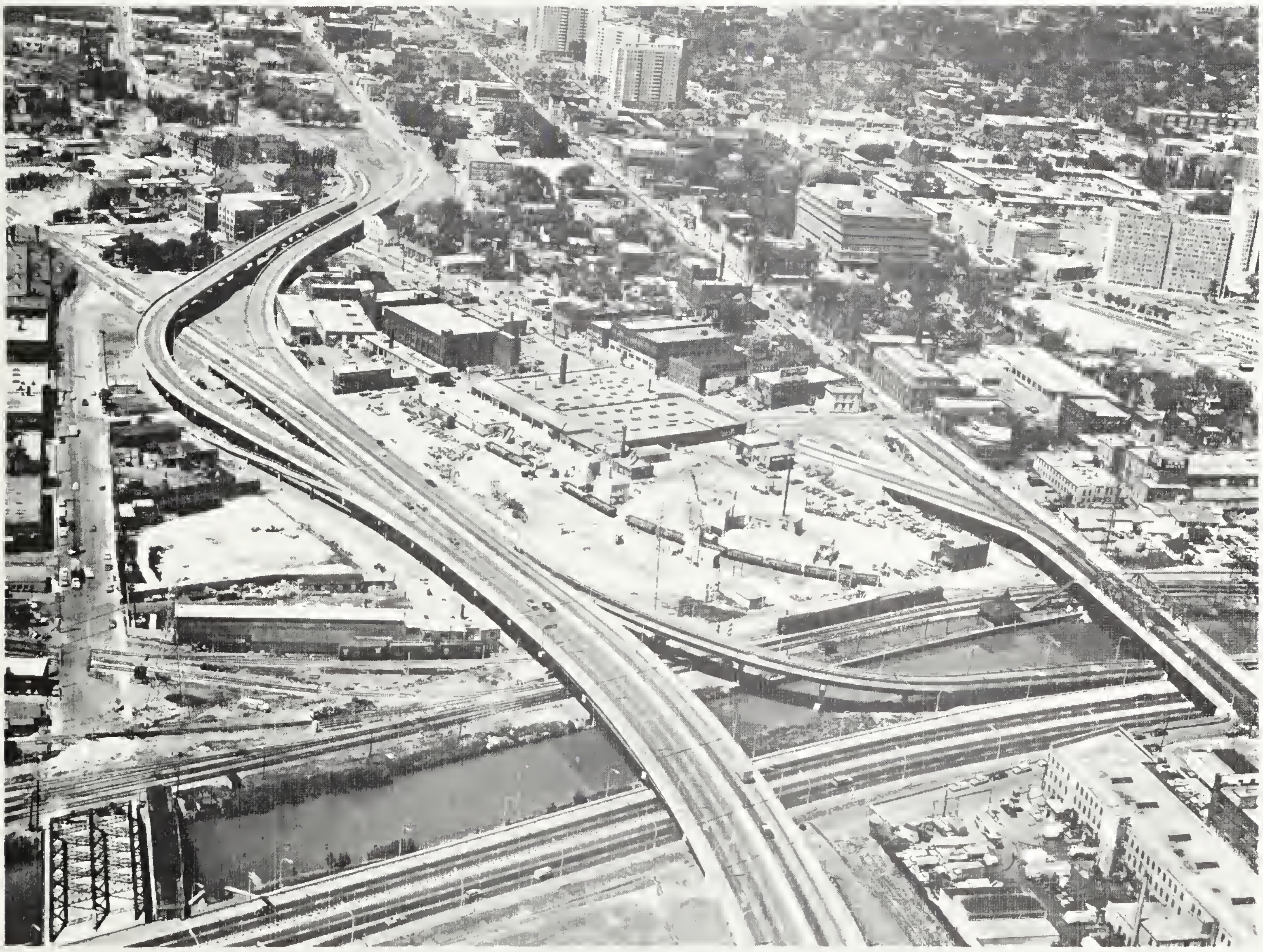
Expenditure on the Parkway, and all its related works, totalled $36,006,603 to the end of 1964.

Duke-Duchess - Connection to Don Valley Parkway

Construction on this adjunct to the Don Valley Parkway, which is to provide a high-capacity exit to the down-town district as an alternate route to the Frederick G. Gardiner Expressway, has progressed to the point that it should be in complete operation by the Summer of 1965.

The first curved welded steel plate girders ever fabricated in Ontario formed part of the Duke-Duchess Interchange. Located in one of the approach ramps of the Don Valley Parkway, they follow the curvature of the road design, which is composed of two circular curves on a varying grade. This approach ramp consisted of six spans with four lines of concentric, cambered steel girders, some of them with tapered ends and each continuous over two spans, without any field splices. The overall depth of the girders was 58" and their finished lengths varied from 146 to 162 feet.

This $10,000,000 project of concrete, steel and earth embankment incorporates a relocation of Eastern Avenue and a combined river crossing and grade separation of the main line tracks of the C.P.R. and C.N.R.



Completed Duke-Duchess Connection.

Don Mills Road - With the Don Valley Parkway north of York Mills Road being designed to occupy the Woodbine Avenue right-of-way, construction on the Extension of Don Mills Road from York Mills Road to Steele's Avenue, which is to provide an alternative access for lands adjacent to Woodbine Avenue, was commenced in January, 1963.

Construction consisted of a structure over the Don River and an embankment for an ultimate 6-lane pavement. This work included rerouting of the River, channel lining, and the installation of two check dams. So extreme were changes in soil and ground water conditions just north of York Mills Road there was a difference in driven length of up to 20 feet in piles only 8 feet apart.

Completion of the roadway between York Mills Road and Sheppard Avenue, and a bridge over the Macdonald-Cartier Freeway, are scheduled for June 30, 1965. Roadwork on the section from Sheppard Avenue to Van Horne Road was completed in July, 1964.

Total length of the Extension as proposed is four miles.

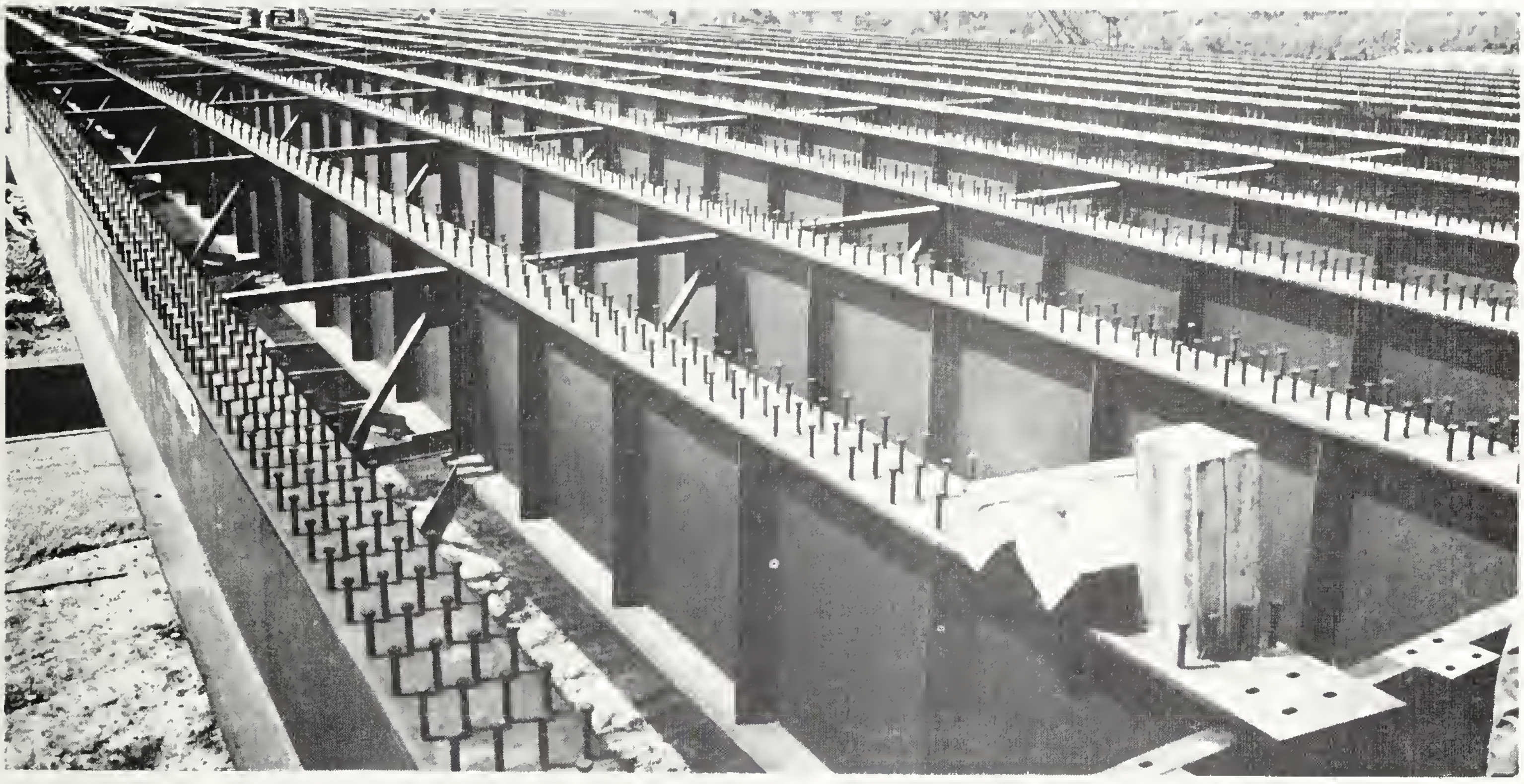
Authorization was received in 1954 for reconstruction of the section of Don Mills Road from O'Connor Drive to York Mills Road at a total cost of $4,000.00.

This project will include two grade separations -- replacement of the existing timber bridge over the C.N.R. north of Lawrence Avenue and elimination of the level crossing at the C.P.R. north of Eglinton Avenue. The pavement is to be constructed to a basic width of 50 feet with additional widening and channelization at intersections and additional widening at structures.

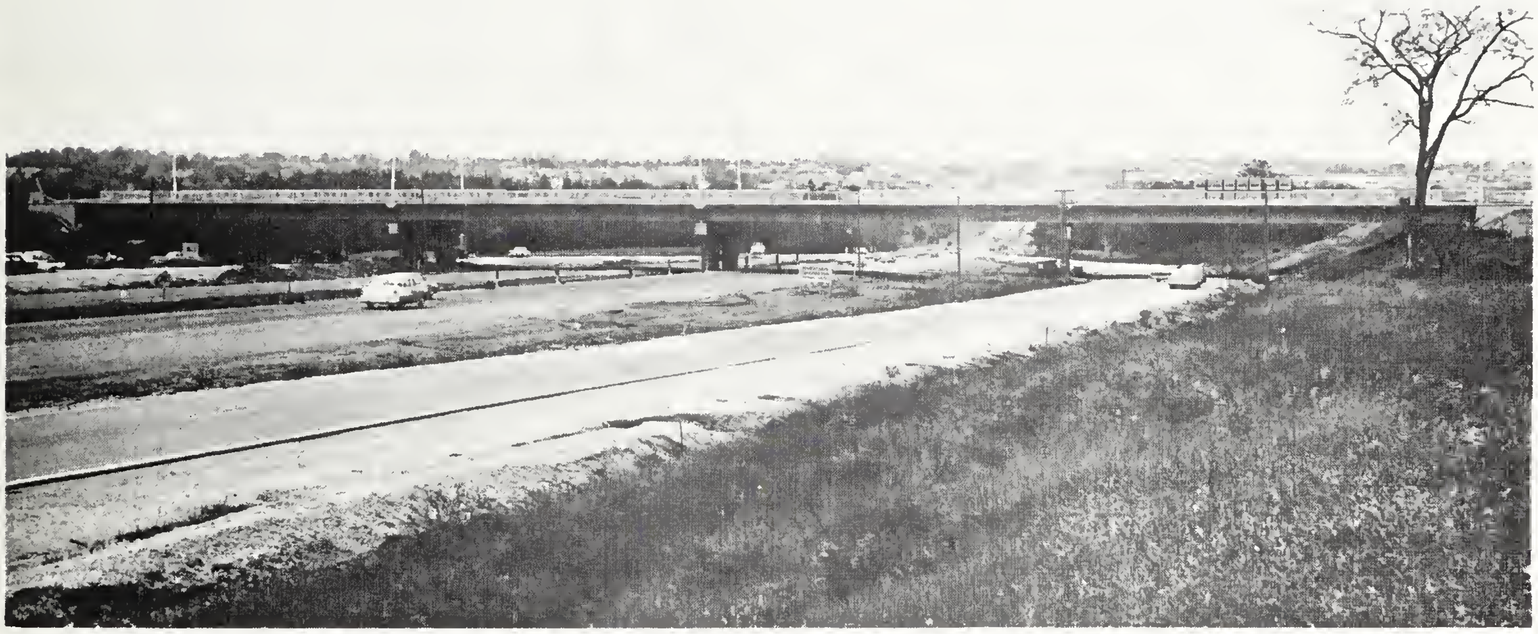
York Mills Road - Only that section of York Mills Road between Don Mills Road and Woodbine Avenue is presently in the Metropolitan roads system.

Scheduling of the Don Valley Parkway northerly from Lawrence Avenue provides for the closing of Woodbine Avenue in 1965, and in order that subdivisions north and south of York Mills Road would not be deprived of access during the period of construction this thoroughfare was improved in 1964.

Grading was completed for six lanes and four lanes paved with curbs and gutters and drainage. Work included replacement of the bridge over the east branch of the Don River.



Don Mills Road Bridge over Macdonald-Cartier Freeway.



A 42-inch storm sewer was required to carry the run-off from the Don Valley Parkway Interchange at York Mills Road westerly, and due to steepness of the grade of York Mills Road six drop manholes were necessary to cut the velocity of the storm water.

The roadwork was essentially completed before the bridge structure was completed, because of delays in steel deliveries. However, traffic was permitted over the south side of the bridge on December 19, 1964, and the complete roadway was available for travel on May 6, 1965.

Spadina Expressway - Eleven contracts have been awarded for the Spadina Expressway, which is the third phase of the Metropolitan Toronto Expressway System.

A temporary road constructed on the Spadina right-of-way connecting Lawrence Avenue to Yorkdale Road was opened to traffic on January 27, 1964. This section features extensive retaining walls and structures at Flemington Road, Ranee Avenue, and Yorkdale Road.

Work is presently being concentrated on the Turboleaf Interchange with the Macdonald-Cartier Freeway, where a network of 26 structures are in course of construction at an estimated cost of $10,000,000.00. The round-figure breakdown of this is $5,000,000 by the Province of Ontario, $4,000,000 by Metropolitan Toronto and $1,000,000 by the Yorkdale Shopping Centre.

This maze of structures is being co-ordinated with the development of the Macdonald-Cartier Freeway to 12 lanes by the Department of Highways, and it is expected that full use of the Interchange will be available in 1966. It will have a mile and a half of bridges, which will contain the equivalent of 20 miles of single-lane roads, in its ramps and overpasses.

It is outranked in complexity on the Continent only by the system bypassing Chicago's Loop and the Los Angeles four-level Stack.

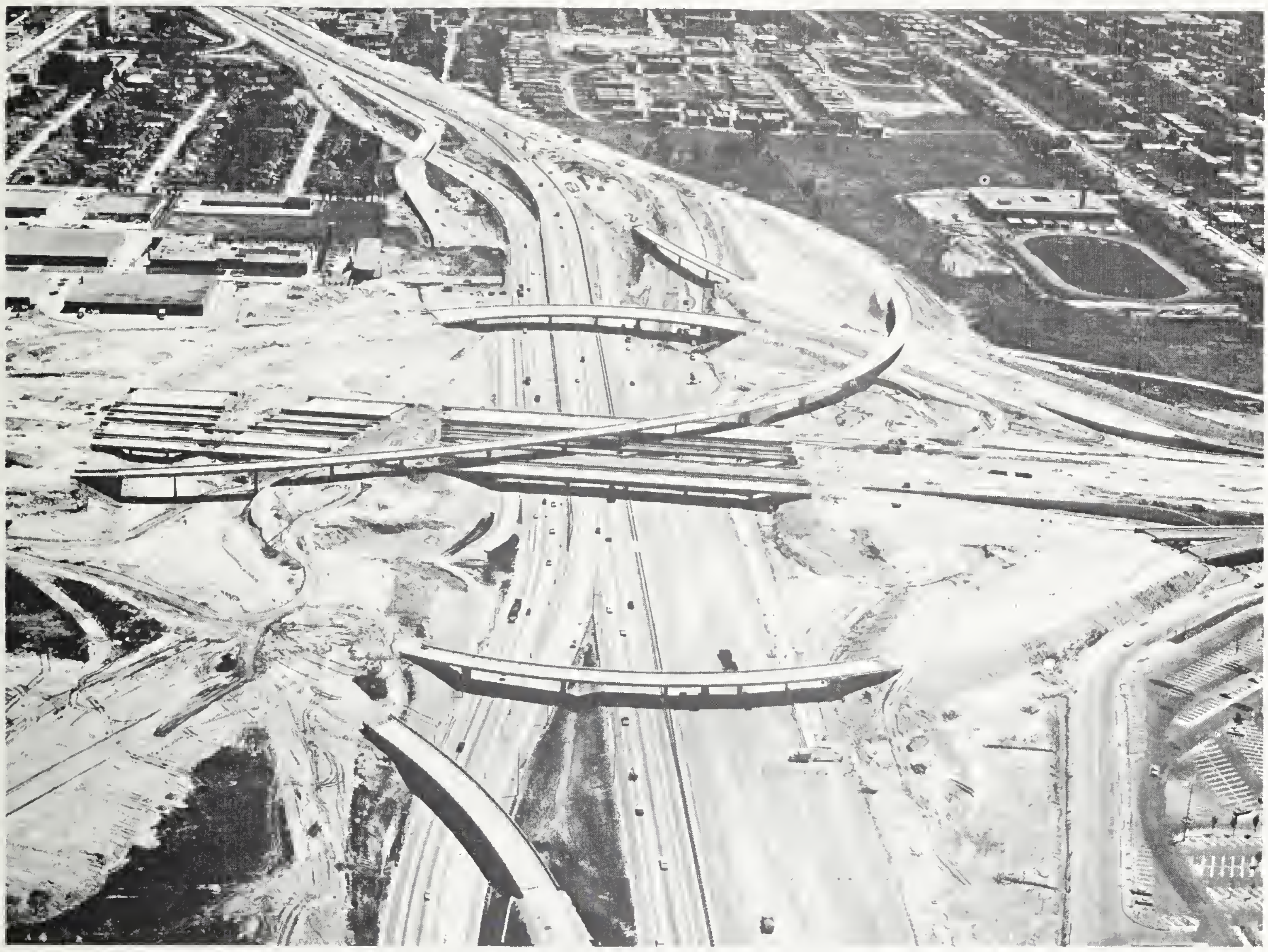
This Interchange will become the heart of an interlocking series of drainage areas, brought about by the Shopping Centre, the depressing of the Freeway and of the Expressway south of the Interchange. This necessitated construction of 13,000 feet of storm trunk drain, at depths of from 34 to 80 feet below ground level, to the Don River.

As the invert of the tunnel portal is 69 feet above the river, it was considered essential that the energy be dissipated before it entered the river. Consequently, the water is carried down the face of the hill in a spillway to a stilling basin.

This sewer project cost $2,500,000.

The entire Expressway will extend from Bloor Street to Clanton Park Road, a distance of about six miles, and its roadway will have a concrete surface rather than asphalt.

The roadway base will be of soil cement stablilization, which is a mixture of fine soil and portland cement with sufficient moisture added to bring the dry material up to a maximum density.

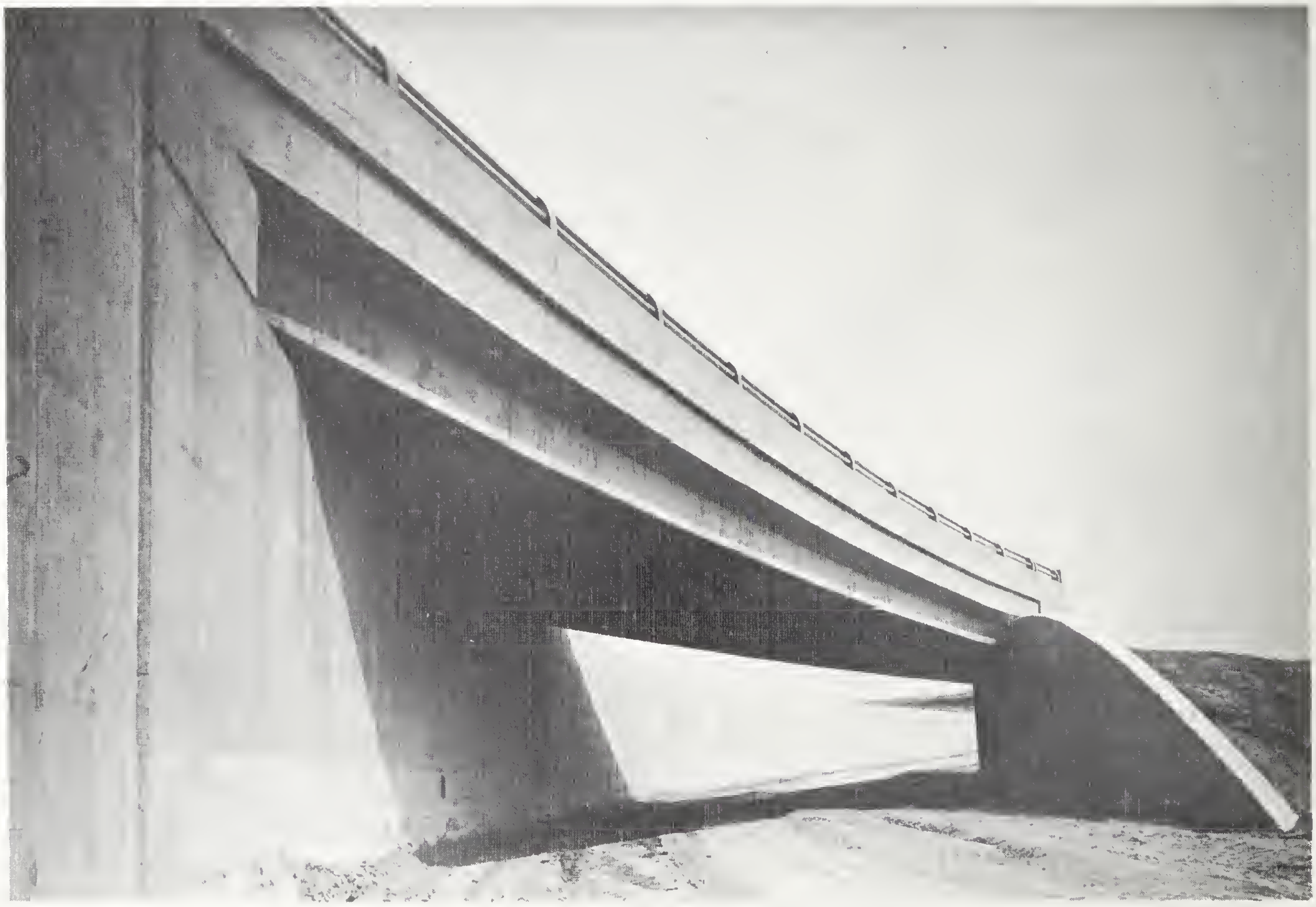


Construction on Turboleaf Interchange of Spadina Expressway with Macdonald-Cartier Freeway.

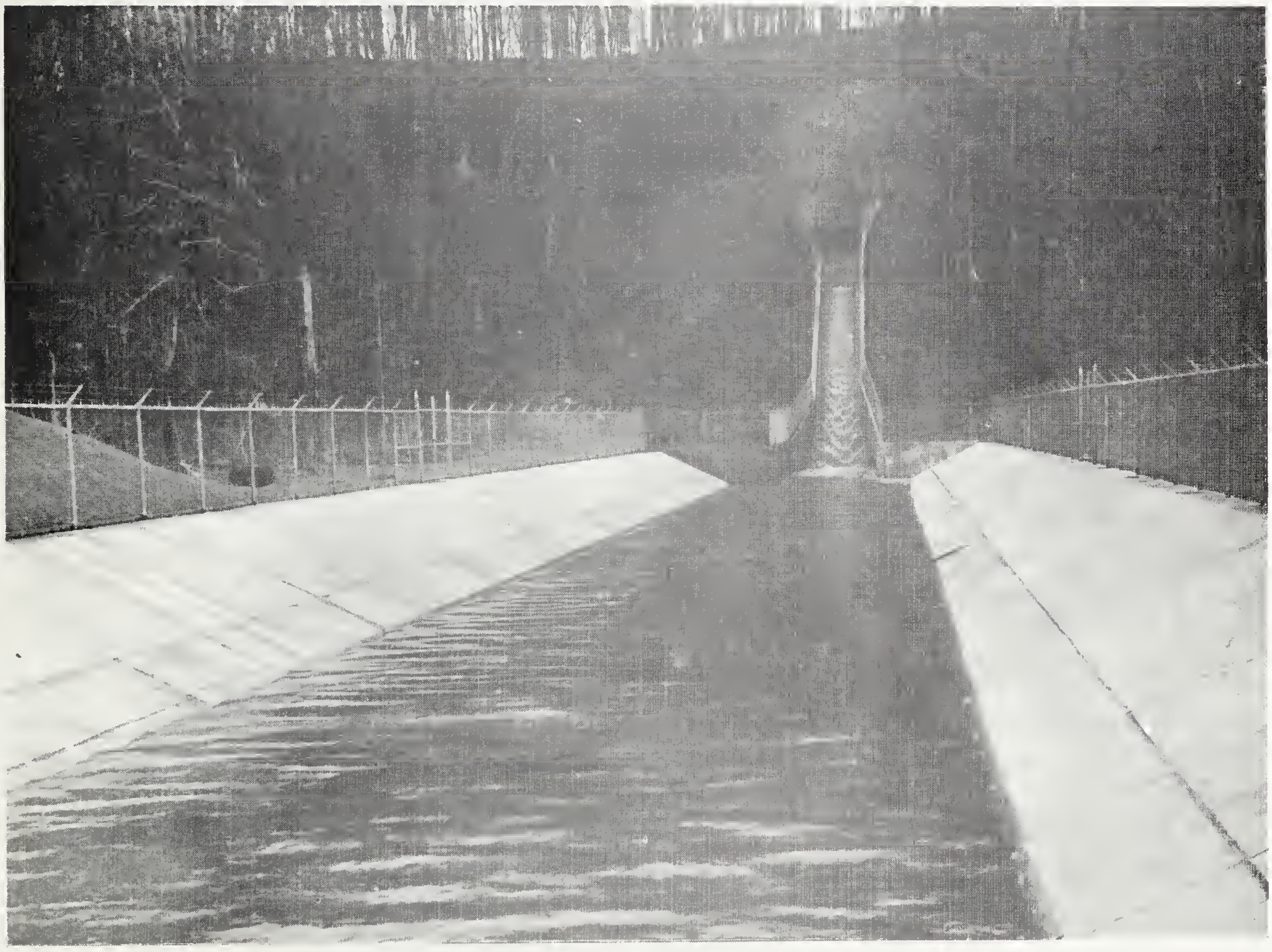
When the mixture has been compacted and the surface sprayed with an asphalt emulsion to seal in moisture, the result is a rock-hard, permanent road base which continues to gain strength over the years. A 6-inch thickness of soil-cement base can take the place of more than 12 inches of conventional gravel and stone base.

Construction of the rapid transit right-of-way of the Toronto Transit Commission in the median, including tunnels and structures, is being undertaken co-incidentally with development of the Expressway.

Spadina Expressway Structures



Section of Spadina Expressway, north from Lawrence Avenue, with provision in Median for Rapid Transit System.



Outfall of Storm Trunk Drain and Stilling Basin, at Don River, draining Interchange of Spadina Expressway and Macdonald-Cartier Freeway.

- GRADE SEPARATION PROGRAMME -

In 1954, Metropolitan Council approved a progressive programme of Grade Crossing Eliminations. Priorities were established according to the average annual daily traffic at level crossings and the number of passing trains, with factors produced therefrom.

The changing scene has required a number of revisions in the programme, but as of the end of 1964 twenty-seven such major projects had been completed and three structures reconstructed.

Projects opened to traffic during the two years covered by this report were:

	Opening Date
Kennedy Road - Subway under C.P.R., west of Agincourt	June 30, 1963
Eglinton Avenue East - Subway under C.N.R., at Bellamy Road	Sept. 3, 1963
Lawrence Avenue West - Subway under C.N.R., east of Keele Street	Sept.11, 1963
Sheppard Avenue East - Subway under C.P.R., at Agincourt	Dec. 11, 1963
Wilson Avenue - Subway under C.P.R., east of Weston Road	Nov. 15, 1964

Completed, but not opened to traffic in 1964, was the structure forming part of the Duke-Duchess complex. This eliminated the necessity of a major grade separation which was originally proposed by the City of Toronto where Eastern Avenue crosses the tracks of the C.N.R. and C.P.R.

The design and supervision of the basic structures carrying tracks over Eglinton Avenue East and Lawrence Avenue were undertaken by the C.N.R. in accordance with their system policy.

All five subways were constructed to provide for six lanes of traffic. However, The Board of Transport Commissioners for Canada limited their contributions from the Railway Grade Crossing Elimination Fund to the comparable cost of a structure of a four-lane width.

Elevated sidewalks were constructed in all structures.

The Sheppard Avenue subway at Agincourt was the first prestressed concrete structure to support a railway line in Canada, and, according to the record, is the first continuous prestressed concrete rail structure in North America. This type of overpass was chosen because of the large skew of 66°, long spans and heavy loads which would be encountered because of it being the main Toronto - Montreal line of the C.P.R.

Sheppard Avenue is a major traffic artery for the north-east section of the Metropolitan area and when the C.P.R. opened its marshalling yard it increased the number of tracks required from three to five. This led to the decision to construct a major structure.

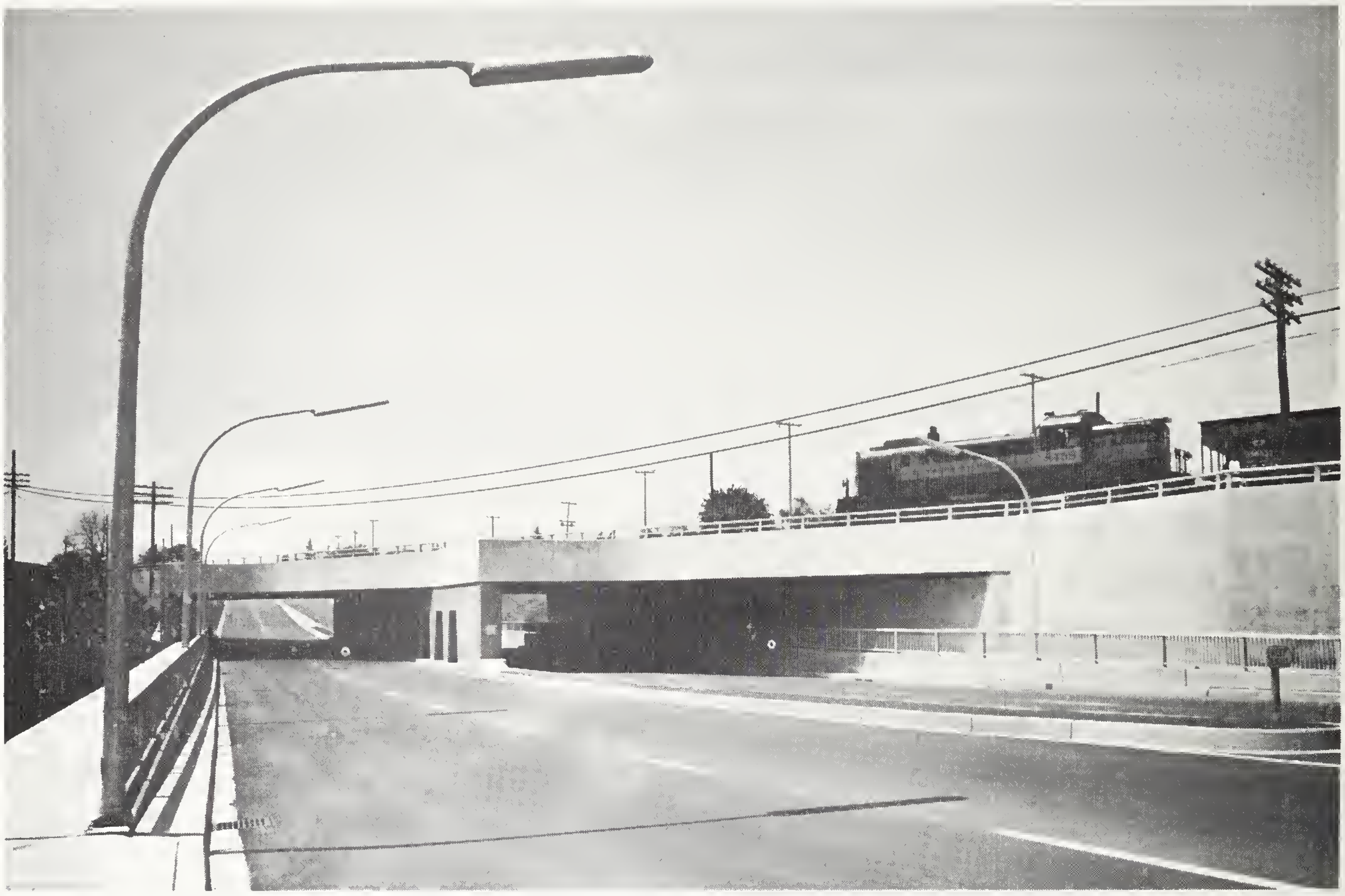
A number of alternatives were considered, but all were ruled out in favor of the hollow-box, cast-in place long prestressed concrete girders, which were most suitable for this location, inasmuch as they permitted spanning square to the roadway and taking advantage of the flexibility of a concrete slab lay-out to reduce the extensions of the portal entrance to a minimum. It was considered that the final appearance would be aesthetically pleasing.

The subway on Eglinton Avenue East was also constructed on a 66° skew, but since its depth was not as critical as that at Sheppard Avenue the superstructure was designed entirely in steel. It was necessary to construct a pumping station in order to lift the drainage flow from the Eglinton Avenue subway.

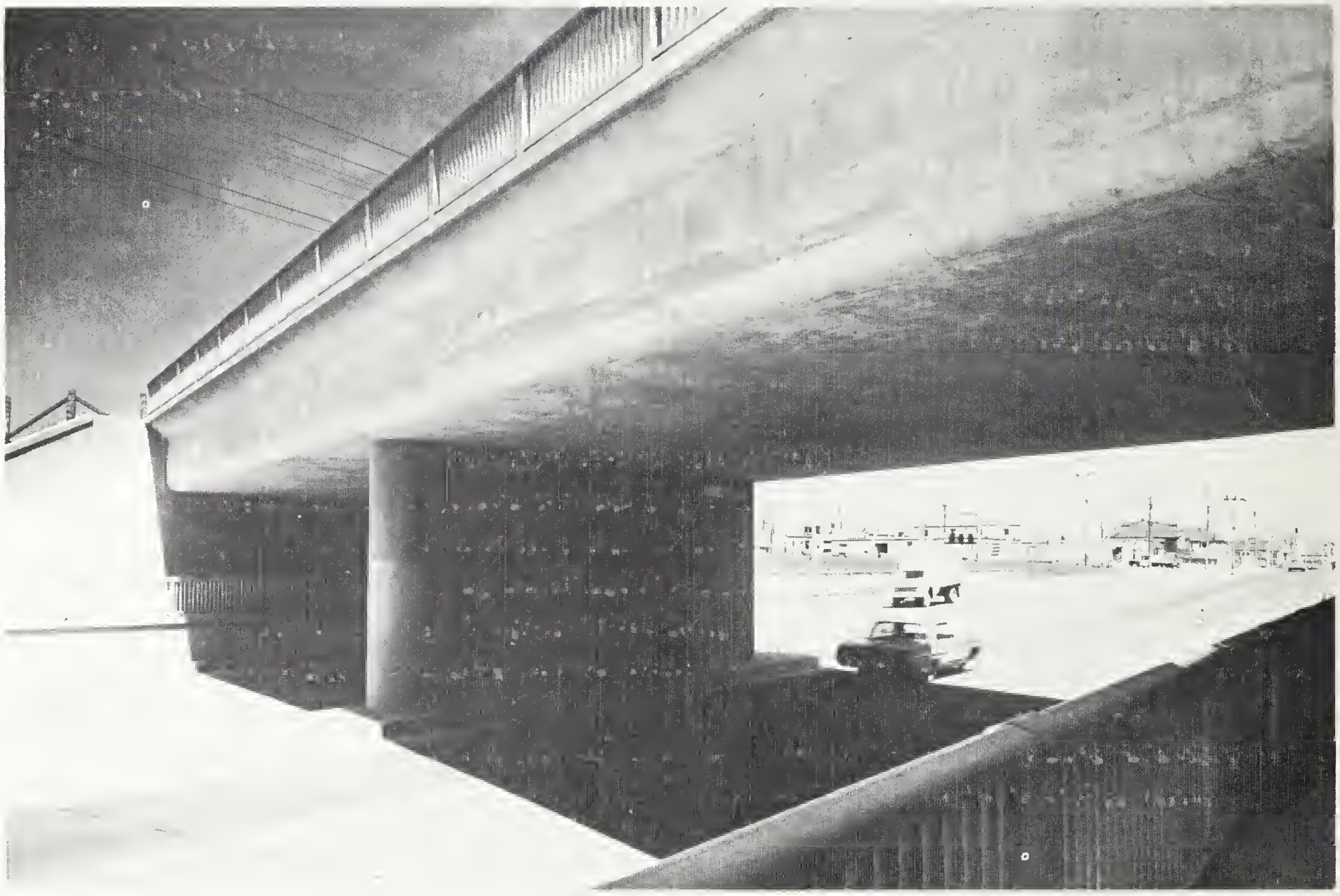
Installation of lighting for railway subways is paid for by the Metropolitan Corporation from grade to grade. At the break of grade the intensity of lighting employed by the area municipality is picked up and gradually increased to a higher level in the subway.

Contributions received during the eleven years since the inception of Metropolitan Toronto on account of Railway Grade Crossing Eliminations were as follows:-

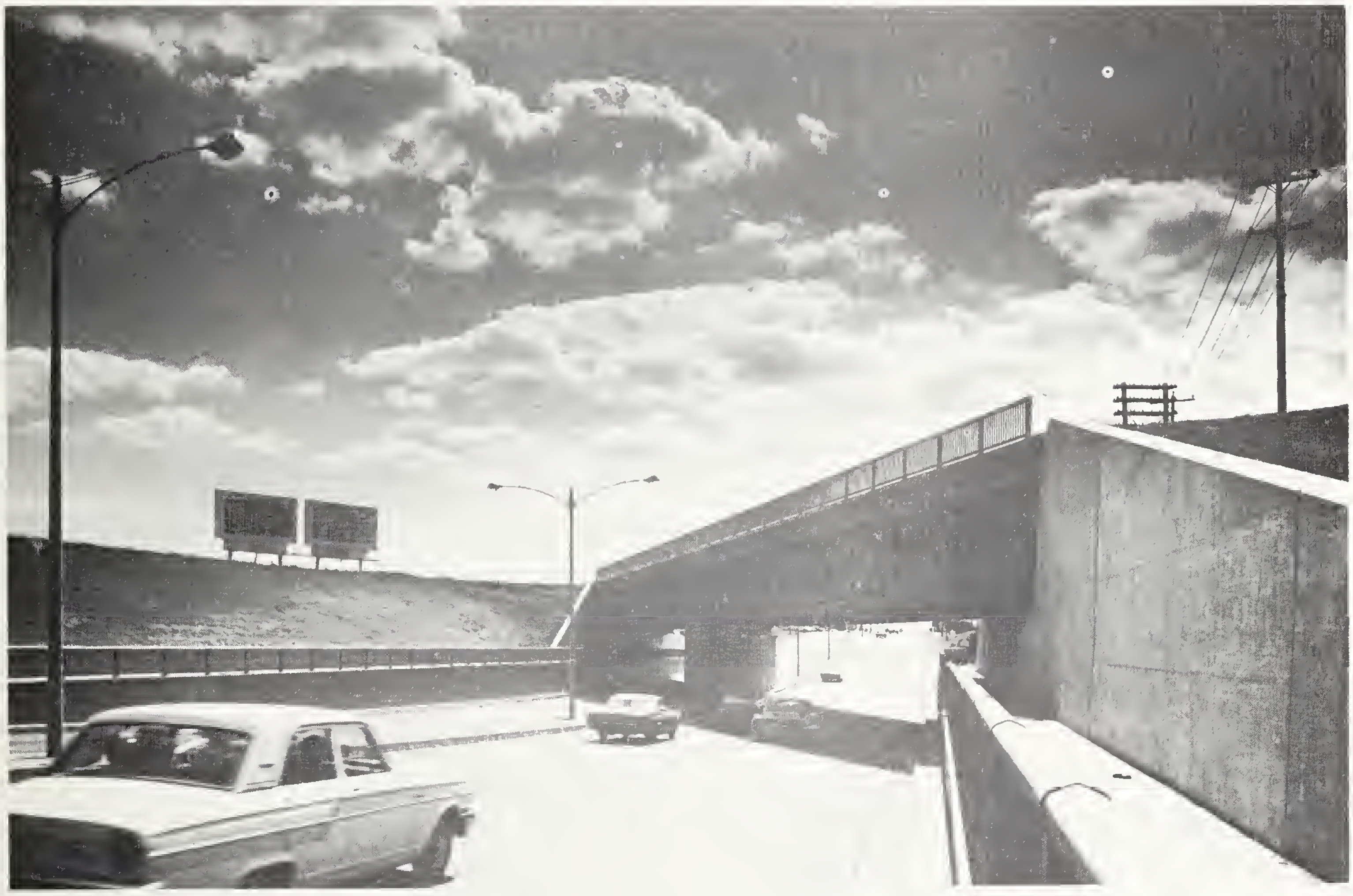
	$
Government of Canada - Railway Grade Crossing Fund	8,002,521
Canadian National Railways	283,995
Canadian Pacific Railway Company	507,829



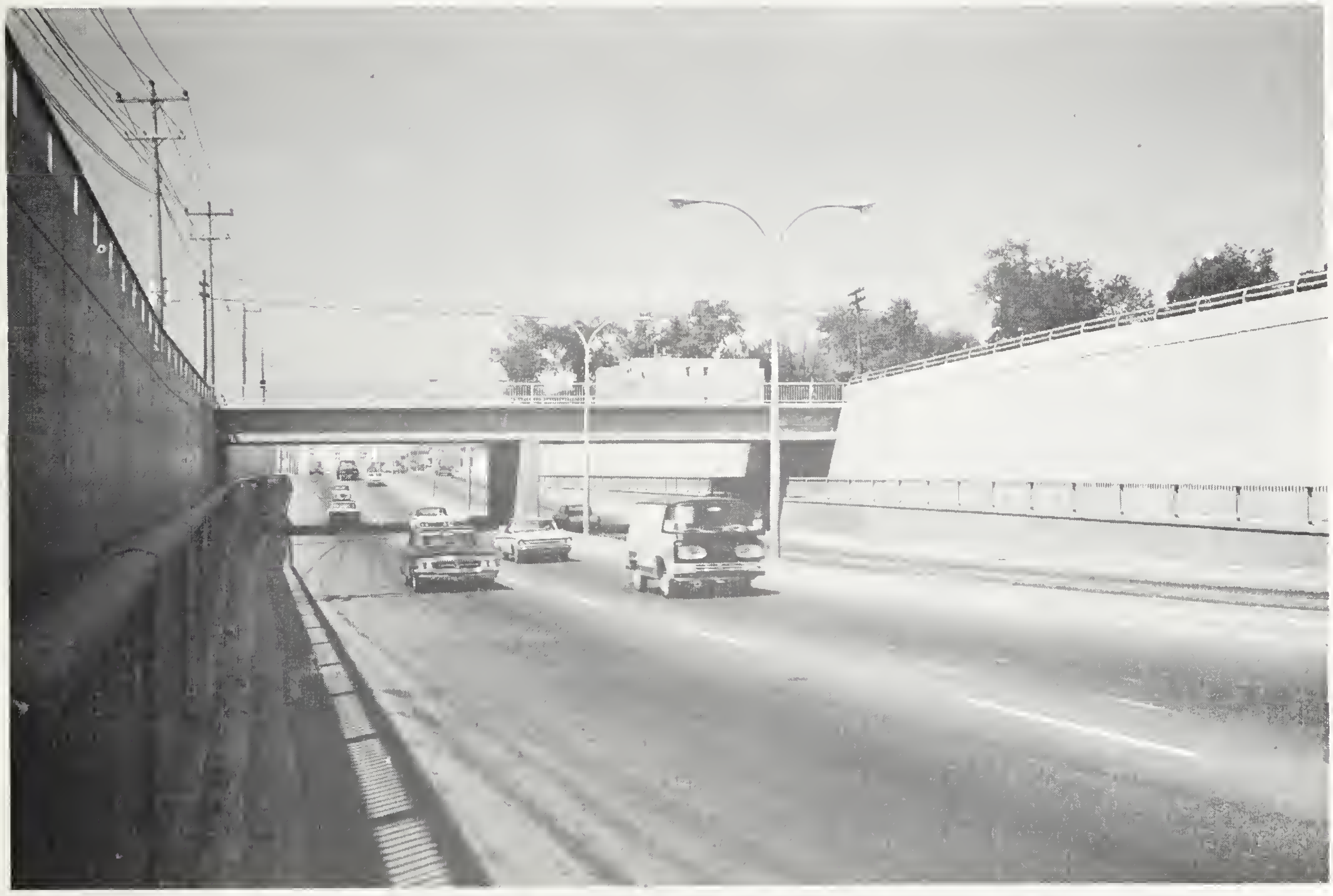
GRADE SEPARATIONS: Sheppard Avenue East



Wilson Avenue



Eglinton Avenue East



Lawrence Avenue West

- PAVEMENT WIDENINGS -

The extensive programme of improving roads assumed into the Metropolitan Roads System continues to the extent of funds available. A short commentary on such major improvements undertaken in 1963 and 1964 follows:-

Annette Street Realignment - Because of modern day increases in traffic volumes and speed, a significant rise in traffic accidents and fatalities was being experienced on the curved stretch of Annette Street in the vicinity of Laws Street. The close proximity of two elementary schools compounded the necessity for immediate solution of these problems.

During the Summer of 1963 thirteen houses on the south side of Annette Street were demolished to make way for a complete realignment of the roadway between Clendenan and Evelyn Avenues.

Construction commenced in September, 1963, and was completed on November 30, 1963. The contract cost was $77,258, but utility relocations, property costs, etc., increased the capital cost to $328,875.

Bayview Avenue - During the two years covered by this Report two sections of this important thoroughfare were improved. The stretch extending northerly from Eglinton Avenue to Blythwood Road, which was formerly 40 feet in width with narrow lanes resulting in consequent traffic congestion, was widened to 50 feet, providing 12-foot lanes. This was accomplished by November 23, 1963.

Reconstruction of the original two-lane roadway between York Mills Road and Sheppard Avenue was completed by November 14, 1964. This conformed to the established standard of 50 feet.

Lawrence Avenue - Two sections of Lawrence Avenue West, which are very important to the carrying capacity of this road, were improved and a third commenced.

The section between Bathurst and Yonge Streets was reconstructed and the original two-lane pavement replaced with four lanes and throat widenings at major intersections. This improvement was complicated by the fact that most of it required to be undertaken on the original 66-foot road allowance, as the small set-back of buildings precluded obtaining road allowance widenings. A number of property owners were concerned and there was a constant endeavor to minimize interference to them during construction.

Work on this section was co-ordinated with that of the Toronto Hydro-Electric System, who replaced much of their overhead wiring with underground circuits.

This work was completed on November 14, 1964.

The widening of Lawrence Avenue between Dufferin and Keele Streets was undertaken coincidentally with construction of the subway one-half mile east of Keele Street at the C.N.R. right-of-way.

A further section reconstructed was that on Lawrence Avenue East which lies between Don Mills Road and Leslie Street, and which was opened to traffic on August 12, 1964.

Lawrence Avenue East, at intersection of Don Mills Road

With the finishing touches having been applied to these two sections, the reconstruction of Lawrence Avenue between Scarlett Road in the Town of Weston and Markham Road in the Township of Scarborough has been completed, with the exception of a short section east of Bayview Avenue where traffic volumes have not reached the level which would warrant road construction.

Work was commenced in July, 1964, on a high-level bridge at The Willows crossing Highland Creek east of Markham Road on Lawrence Avenue East.

The structure is to be 800 feet long and will rise approximately 90 feet above Highland Creek. It is being constructed entirely of reinforced concrete and its feature will be the long spans of 158 feet, each of which will be carried by 10 post-tensioned beams. The size of these beams, which are over 8 feet in depth and weigh approximately 130 tons, necessitates their being cast and stressed on the site, at a location on the west approach to the bridge. They are then carried on a structural steel truss being specially constructed for the purpose and launched into position on the piers.

Wilson Avenue - Because of reconstruction of the Macdonald-Cartier Freeway and its interchange with Highway 400 immediately to the south of Wilson Avenue, the widening of Wilson Avenue between Clayson Road and Walsh Avenue was undertaken in 1964. This work included the grade separation under the C.P.R.

Extensive relocations of sanitary sewers and watermains were undertaken early in the year, with facilities of Utilities following. This reduced the number of time-consuming obstacles to be faced by the contractor, who commenced work in June, 1964, and completed the road and bridge construction by November 15, 1964.

Concurrent with completion of the Avenue Road and Macdonald-Cartier Freeway Interchange, and because of its proximity thereto, improvement of the intersection of Avenue Road and Wilson Avenue, and reconstruction of Wilson Avenue from Avenue Road to Bathurst Street was required.

Work was commenced in June, 1964, and the completed roadway was opened to traffic on July 31, 1964.

Islington Avenue - This thoroughfare which had been assumed from the Township of Etobicoke between The Queensway and Albion Road, in 1962, was an area of further improvement between Princess Margaret Boulevard and Dixon Road by November 15, 1964.

The existing two-lane pavement was widened to four lanes and the existing ditch drainage system eliminated by the installation of concrete curbs and gutters. Left-turn lanes at The Westway and bus bays at appropriate locations were installed.

Because of the forward planning of the Township of Etobicoke, a 120-foot road allowance was available resulting in a decided saving in property requirements.

With completion of the Intersection of Dixon Road, scheduled for 1965, Islington Avenue will be four lanes in width from The Queensway to the Macdonald-Cartier Freeway.

Warden Avenue - The recent completion of the Warden Avenue and Ellesmere intersection by the Township of Scarborough and the increase in traffic requirements from this point to the Macdonald-Cartier Freeway indicated that the existing gravel surface of Warden Avenue should be reconstructed and widened.

This work was commenced in September 1964 and the completed pavement including the elimination of the jog at Warden Avenue and Sheppard Avenue opened to traffic on November 15, 1964.

Kennedy Road - Two further sections of Kennedy Road were completed during 1963 and 1964. These were the intersection at Eglinton Avenue and the section north from Lawrence Avenue to the Macdonald-Cartier Freeway. This now completes the reconstruction of the Danforth Road-Kennedy Road artery from Danforth Avenue north to the Macdonald-Cartier Freeway.

Victoria Park Avenue - A further portion of Victoria Park Avenue was reconstructed south from O'Connor Drive to the intersection of Dawes Road including throat widenings and channelization at St. Clair Avenue and Dawes Road.

AS THEY WERE ....

Annette Street Realignment .....

Islington Avenue .....

Warden Avenue .....

..........AND AS THEY ARE

- MAINTENANCE -

By the end of 1964, the lane mileage of the Metropolitan Road System had increased to 1,230 lane miles from the 780 assumed in 1954. Of this, 850 lane miles were maintained by the Department's own forces or by contractors. On the approximately 380 lane miles of roads within the City of Toronto, the patrolling, minor repairs to pavements, curbs and bridges, as well as Winter maintenance, were carried out by the City of Toronto on a work-order basis. The Expressway System is entirely covered by contract.

The Department continues its policy of undertaking major works by contract and supplementing its own work forces by engaging contractors and rented equipment.

The Winter seasons of 1963 and 1964 were characterized by light snowfalls, with a total of 47.9 inches falling in 1963 and 46.9 inches in 1964, as compared with a 30-year average of 54.9 inches. Due to the increasing lane mileage, the amount of sand and salt used continued at a high level, despite the lighter amount of snowfall.

A few pertinent figures are -

	1963	1964
Tons of Sand	9,630	5,169
Tons of Salt	36,676	36,354
Hours of Snow Plowing	3,951	5,362

Maintenance Contracts called were -

Resurfacing	7	3
Intersectional Improvements	1	1
Bridge Repairs	3	4
Cut Repairs	1	1
Winter Maintenance	5	5

Permits were granted, as follows, in respect to applications submitted by Area Municipalities and Public Utilities -

Installation of Services on Roads	1,720	1,659
Building Location Approvals	255	244
Entrance Permits	168	181

Extensive repairs costing $250,000 were made to the Bathurst Street Bridge over the railway tracks between Lake Shore Boulevard and Front Street.

This structure consists of four main sections -- a 200-foot truss span, which is the responsibility of the C.N.R.; a 200-foot through plate girder span; five 27-foot reinforced concrete slab spans; and a 50-foot rolled steel beam span.

Deterioration of the reinforced concrete and structural steelwork in the bridge was in an advanced stage, and the greater part of the road deck was completely replaced.

The bridge was closed to roadway traffic in December, 1963, but T.T.C. tracks were alternately detoured to one side of the structure while repairs were carried out on the other side, thus permitting uninterrupted street-car operation. Concrete was placed during the Winter and was enclosed and steam-cured.

The structure was completely re-opened to traffic on June 30, 1964.

Repair operations on Bathurst Street Bridge

- GENERAL -

Mileages of Metropolitan Roads - As of December 31, 1964, the mileage of the Metropolitan Roads System was as follows:-

Mileage originally assumed	277
Mileage since assumed	56
Expressways constructed	15
New Arterial Roads constructed	16
Mileage of Metropolitan Roads System as of December 31, 1964	364

Lighting

The Metropolitan Department of Roads is responsible for the design and construction of lighting on all expressways, grade separation projects and bridges on Metropolitan Roads, whereas lighting of the roads proper is the responsibility of the area municipalities.

In the design of lighting for expressways and important structures the basic guiding principles have been -

(1) The proper amount of light on the roadway compatible with its traffic needs;

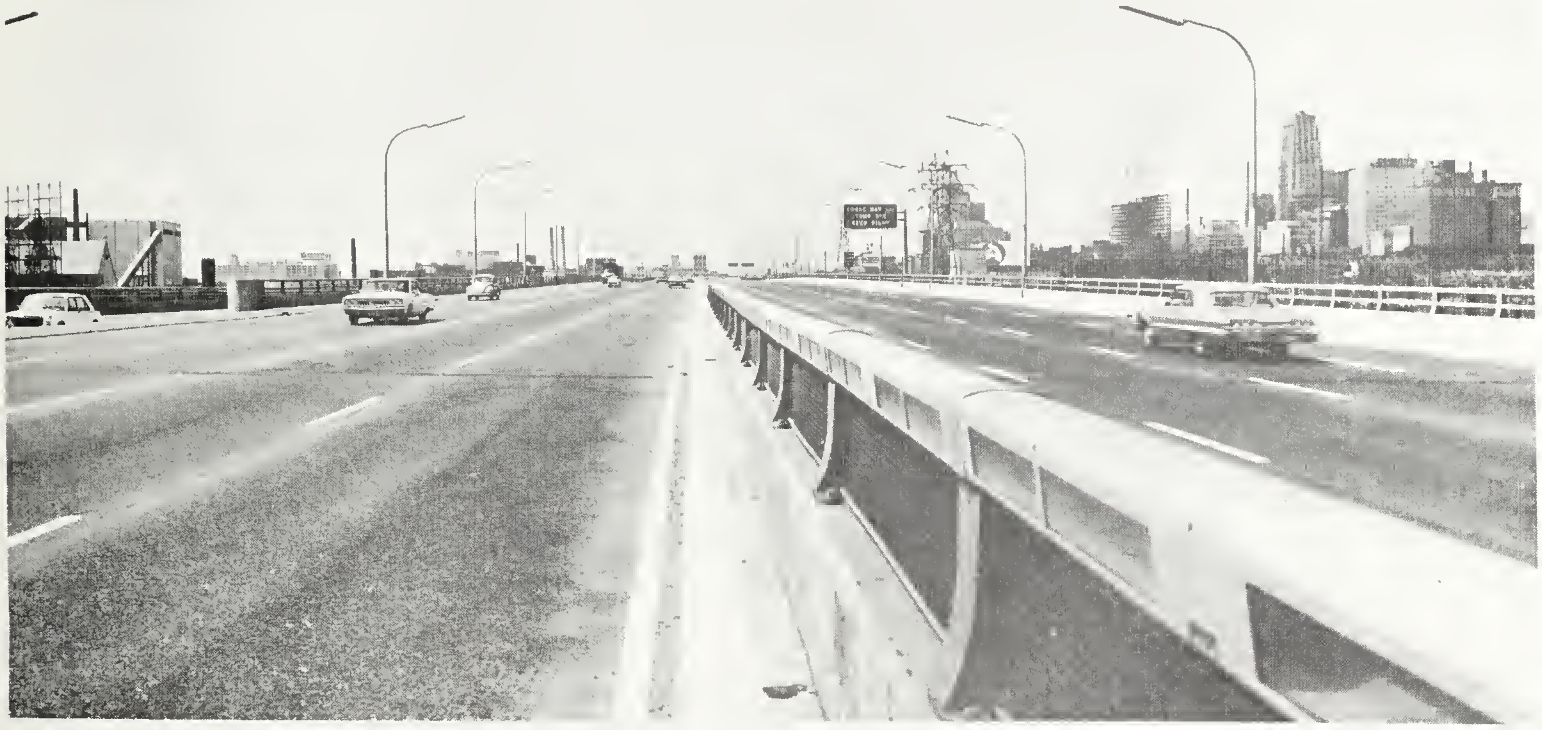
(2) Elimination of glare;

(3) Enhancement of aesthetics of the project.

These requirements have led to adoption of fluorescent lighting as a standard, which is used in two forms ...... Overhead and Railight.

Overhead lighting system is used in general, but where a higher degree of lighting is necessary due to the width of the road and to the surrounding area development, Railight is used. Railight is also used on ramps of expressways where delineation is of value

All overhead lighting is carried on either aluminum or spun concrete standards to eliminate painting maintenance and to



Double-faced railight on the median of the Frederick G. Gardiner Expressway supplements overhead fluorescent lighting where deck is of extra width. To be noted are the aluminum-mesh glare shield and painted curbs for better lighting reflection.

prevent rust marking the concrete structures. Glare is eliminated completely by the use of shielded optical luminaires.

Metropolitan Toronto was the first road authority on this continent to develop the use of double-faced Railight, such as is installed on the median of the Frederick G. Gardiner Expressway.

Snow and Ice Removal from Road Surfaces by Electrical Heating

The experiment begun in 1961 of placing electric heating elements immediately under the driving surface of ramps on the Frederick G. Gardiner Expressway and energizing them has been enlarged considerably for further observations.

The basic idea of the original study was that of keeping access ramps, which are key spots on any expressway system, free from ice and snow so that capacity of the facility could meet rush-hour traffic demands. If salting trucks and snow plows were to leave the main deck of an elevated expressway, it would be difficult for them to return due to snarled traffic on adjoining streets.

Electrical heating was chosen because it offered the best compromise to the somewhat conflicting requirements of an ideal snow-removal system and was attractive for the following reasons:-

1. Power is readily available in the Toronto area.
2. Comparatively easy to control and to monitor.
3. Offers ready application of heat to the areas requiring it.
4. Has uniform heat output over the entire heating element.
5. Low maintenance cost.
6. Very little structural work is involved in the installation.

When the study of snow-melting schemes began, the "on" ramp of the Expressway at Spadina Avenue was under construction, and it was therefore decided to use a small portion of it as the location for the experiment before any large financial commitments were made in connection with the idea.

Four separate heating elements of different wire thicknesses and spacings were installed, following tests of each to determine their resistance and thus calculate the length of each type of wire mesh required to give a specific wattage per square foot of deck.

A transformer station was installed under the main elevated structure, and power was carried at 2400 volts to heating transformers hung at the top of piers and immediately beneath the road deck.

Two electrically-operated oil switches were installed in the transformer station enclosure to switch the heating installation to base load for heating the deck, snow load for melting snow and off. A thermostat controlled the operation of the switch for the base load and was set to turn it on when the air temperature dropped below 38°F.

Results of the initial installation were sufficiently encouraging to enlarge the experimental area during the Winter of 1962-3 to cover the entire "on" ramp.

During this phase a snow detection unit was installed to automatically turn "snow load" on and off. It was located in the transformer station with the snow detector heads mounted on the expressway structure above. The snow detector turns the snow load on when snow begins to fall if the air temperature is below 38°F. It will turn the load off when snow stops.

During the period November 22, 1963, to April 22, 1964, a total of 153 days, snow varying from a trace to 9 inches fell on 96 separate occasions in 61 days, for a total snowfall of 51.7 inches. There was no particular difficulty with melting the snow, and, from this point of view, the installation has been successful. However, the cost of operating the system has been fairly high, as expected.

The estimation of operating costs is difficult, subject as this is to the vagaries of the weather and other conditions which cannot be predicted with any accuracy. However, with time and effort, and the decisions and changes which are being made, this system of melting snow and ice by electricity can become very popular and useful if applied judiciously.

A comprehensive paper on this subject was presented by Metropolitan Toronto Engineers at the last Annual Meeting of the U.S. Highway Research Board in Washington, D.C. It received continent-wide attention, and has been scheduled for publication by the Board.

Heated ramp in heavy snow storm

Control Surveys

During 1963-64 the Department continued its joint project with The Department of Mines and Technical Surveys, Ottawa, to establish a Horizontal Control Co-ordinate System in Metropolitan Toronto.

A total of 26 First Order Stations and 472 Second Order Stations were monumented. The distances between the monuments in the network were measured by electronic survey equipment.

The final geographic co-ordinates (latitudes and longitudes) and plane co-ordinates (northings and eastings on a 3° Zone Transverse Mercator Projection) were calculated in Ottawa.

To relate the network to the individual technical and legal surveys it is necessary to establish control monuments in the immediate vicinity of the project. For this work the Department acquired precise survey equipment including the first Model 6 Geodimeter (Fig. 1) in Canada.

Listed below are some of the immediate ways the Control Survey System will assist the Department:-

(1) Provides control for construction projects.
(2) Relates various projects
(3) Relates property surveys to engineering surveys.
(4) Provides ground control for aerial surveys.
(5) Co-ordinates Department work with private developers and other Departments.
(6) Relates all engineering data.
(7) Eliminates the need to run closing loops.
(8) Reduces the possibility of survey errors.
(9) Standardizes all measurements.
(10) Provides an easy method of calculating and indexing.
(11) Provides a permanent record.
(12) Provides an easy method of survey maintenance.
(13) Eliminates the need to take astronomic observations.

Many other uses of the co-ordinate network will be made as time goes on. A number of these uses depend upon the Municipality undertaking other projects for which the co-ordinates were a prerequisite.

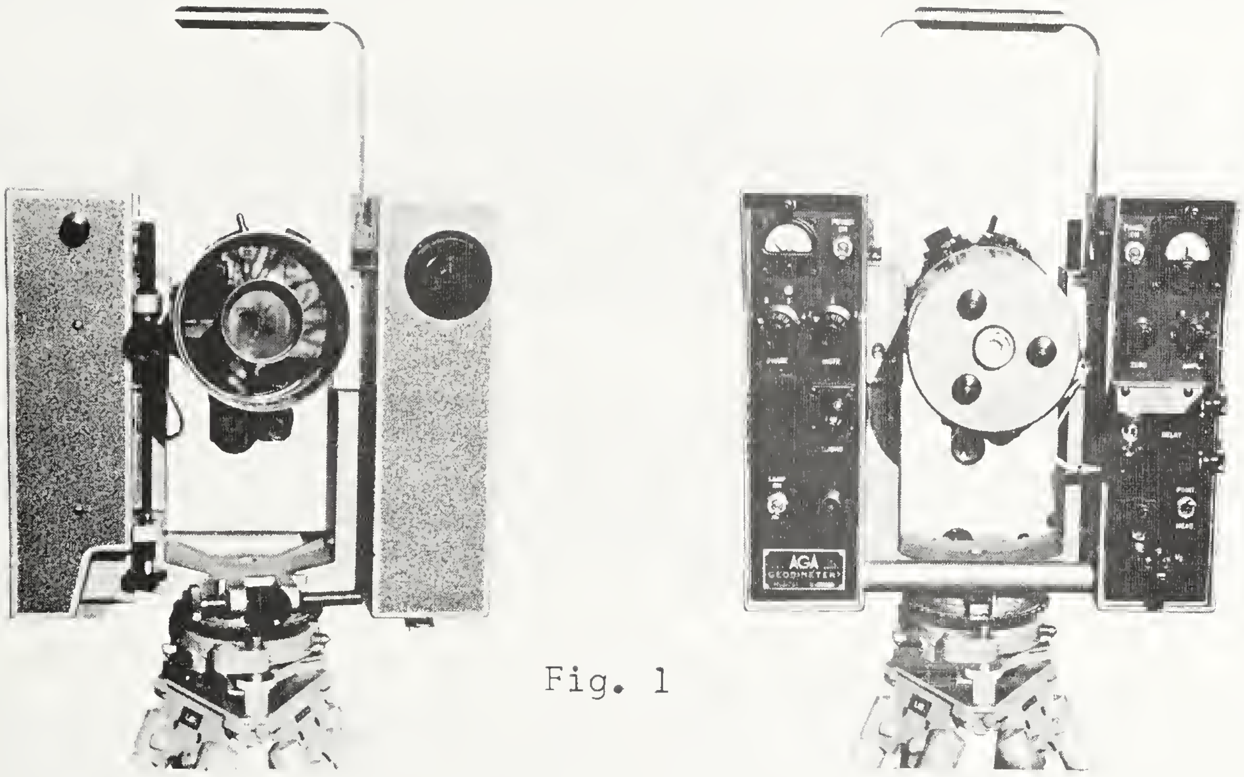


Fig. 1

With the co-ordinate systems now established it is possible for the Municipality to proceed with the following projects:-

The modernizing of the land registration system.

The transferring of all land in the Metropolitan Area into the Land Titles Office (this would include the relating of each parcel of land to the co-ordinate network, the confirming of the boundaries thereof and the confirming of the ownership thereof).

The modernizing of the land survey and land subdivision system in the area.

The integrating of engineering records.

The compiling of basic city maps for the area (topographic, cadastral and utility).

The establishment of a Municipal Data Bank containing all types of information related to geographic location. (The bank will contain the information from the above projects plus information from many other sources, e.g., Assessment, Planning, Welfare, Housing, Industrial Commissioners, etc.).

When these projects are undertaken then the full potential of the co-ordinate survey system will begin to be realized.

Legal Surveys

With the passing of the Expropriation Procedures Act, R.S.O. 1963, and new regulations under The Land Titles Act and The Registry Act, the time required to complete the legal survey and acquire lands required for a Roads project had to be increased. At the same time there has been an increase in the number of properties required.

These changes affected the operations of the Department's Surveys Section, as well as the Property and Legal Departments. To cope with the problem it was decided to extend our policy of engaging private Ontario Land Surveyors.

Two Ontario Land Surveyors on our staff were assigned the task of co-ordinating the work of the private firms and checking and verifying their returns. Extensive use is made of computers for calculation and photocopy methods to obtain Registry Office data.

The Survey Section prepared a comprehensive set of "Instructions for Surveys by Ontario Land Surveyors". These instructions are up-dated, revised and improved from time to time. For this purpose the Section is continuing to gather data and analyze the requirements and effect of Statutes, Court Cases, etc.

A number of the draughting features and the certificates on the survey plans had to be revised to satisfy the new requirements. This involved close liaison between our surveying and draughting personnel and the Inspector of Legal Offices, the office of The Master of Titles and the local Registry Offices.

The requirements of the Expropriation Procedures Act caused a closer liaison to be established with the Property and Legal Departments. A number of meetings are being held annually to schedule expropriation and property acquisitions. The number of parcels expropriated at any one Council meeting has to be restricted because of the time required to process the claims.

Tree Planting

In the rapid and extensive road development which has taken place in recent years, utilitarian considerations have tended to dominate. The primary concern has been to provide the necessary facilities, and, in the process, great numbers of trees have been sacrificed.

Dimunition of tree population is inevitable with increased urbanization, and in 1964 Metropolitan Council approved a planting programme designed to establish new growth wherever it seems desirable for practical or aesthetic reasons. Species of the flowering type are to predominate.

No set plan was established, since conditions existing on various Metropolitan roads are so different, one from another, that what might be a reasonable approach to tree planting on one street might be impractical on another. In the planting of trees the first consideration must be for the existence of underground facilities and those likely to be installed.

An interesting reflection on the planting of trees on road allowances was contained in the Will of the late Thomas Foster, Mayor of the City of Toronto, 1925 to 1927, which read:-

> "To set aside the sum of $100,000 and to use the annual income therefrom in purchasing, planting and thereafter maintaining trees along the sides of main arterial roads into the City of Toronto.... that some plan of systematical beautifying by means of trees on the highways shall be worked out by my trustees in co-operation with those authorities having control thereof,........and that such rows of trees shall be extended continuously as far as funds are available to the extent that parties approaching the City may do so over beautifully-treed roadways."

The administration of this fund has been under the jurisdiction of the Department of Highways, Ontario.

J. D. GEORGE, P.ENG.
CHAIRMAN

COL. F. S. MCPHERSON
SECRETARY

METROPOLITAN TORONTO PUBLIC UTILITIES CO-ORDINATING COMMITTEE

MEMBERS –
BELL TELEPHONE CO.
CITY OF TORONTO
CONSUMERS' GAS CO.
EAST YORK TOWNSHIP
EAST YORK HYDRO
ETOBICOKE TOWNSHIP
ETOBICOKE HYDRO
FOREST HILL
LEASIDE
LONG BRANCH
METROPOLITAN TORONTO ROADS DEPT
METROPOLITAN TORONTO WORKS DEPT.
MIMICO
NEW TORONTO
NEW TORONTO P U.C
NORTH YORK TOWNSHIP
NORTH YORK HYDRO
ONTARIO HYDRO
SCARBOROUGH TOWNSHIP
SCARBOROUGH P U.C.
SWANSEA
TORONTO HYDRO
TORONTO TRANSIT COMMISSION
WESTON
WESTON P U.C.
YORK TOWNSHIP
YORK TWP. HYDRO

The heavy population growth of Metropolitan Toronto, which has placed it in the position of being the third-fastest growing metropolis in North America according to construction trends, is naturally creating an increasing need for utilities.

This demand for services, coupled with the tendency to place utilities underground, has increased the responsibility for their co-ordination.

The MTPUCC, through its regular meetings, are solving problems as they arise, and, when necessary, a question is assigned to a Sub-Committee for study and a recommendation to the main Committee for its solution.

Among other things, two new items of interest have required the Committee's attention.

One of these was establishment of a system for the co-ordination of Capital Works Programmes of all Area Municipalities. The information is distributed to members following adoption of budgets so that problems which might arise are solved before construction begins.

In 1964, the distribution of oil by underground pipes directly to homes was introduced. The Committee studied the problems involved, within its jurisdiction, and resolved the matter to the satisfaction of all concerned. It has been decided that where authorities allow pipe lines to use public road allowances, locations are designated by the Committee according to its Ideal Plan.

MTPUCC utilities plans are becoming more and more useful as their number increases, and considerable money is saved the community each year because of their existence. They serve many purposes in planning, reconstruction, maintenance, etc., wherever a complete picture of existing utilities is necessary.

Sign Regulations

In May, 1963, Metropolitan Council enacted a By-law which prohibits the erection or display of advertising devices other than signs advertising the property for sale on which they are erected or signs erected on commercial buildings identifying or advertising ownership or the products of the owners or occupants of such buildings within 150 feet of the following roads:-

Frederick G. Gardiner Expressway -
between Humber and Don Rivers.

Don Valley Parkway -
between Frederick G. Gardiner Expressway
and Lawrence Avenue.

Bayview Avenue -
between River Street and Nesbitt Drive.

Lawrence Avenue East -
between Donway East and Victoria Park Avenue.

In September, 1964, Council directed that all existing signs overhanging the street allowance by more than 18 inches in the following areas are to be removed by December 31, 1966:-

Yonge Street, west side, between Ramsden Park and 620 feet north of Heath Street West; and on the east side, between Ramsden Park and 178 feet north of Glen Elm Avenue.

St. Clair Avenue, both sides, between Spadina Road and Mount Pleasant Road.

This action followed a recommendation of the City of Toronto, who had conducted a poll of businessmen in the district, which indicated that 127 were favorable to the proposal and 45 opposed.

As 1964 closed, both Metropolitan and City of Toronto Councils were considering recommendations that, effective December 31, 1970, all overhanging signs on Bloor Street and Danforth Avenue, within the City limits, be similarly removed.

In the case of the Yonge-St. Clair regulation (and the Bloor-Danforth recommendation) provision is made that any canopy or marquee used for sign purposes may remain as long as the building on which it has been erected remains.

Storm Sewers

Effective January 1, 1963, the Department of Highways, Ontario, was authorized, under amending legislation, to subsidize construction and maintenance of storm sewers where they provided benefit for the road surface and right-of-way. This followed recognition by the Department of the necessity in built-up areas for storm sewer facilities.

The Department is unable to subsidize local municipalities for expenditures on Metropolitan roads, and in order that the total community might derive the optimum benefit it is necessary for the Metropolitan Department of Roads to pay the eligible costs for the construction and maintenance of storm sewers on Metropolitan roads and to claim the subsidy.

This subsidy is paid on sewers up to 27 inches in diameter and a percentage of the cost of larger sewers.

In the maintenance phase, an area municipality's charges are based on a portion of the mileage of sewers on Metropolitan roads carrying storm flow to the total mileage of such sewers in the local municipality.

In the construction of a storm sewer by an area municipality on a Metropolitan road, the area municipality continues to be responsible for the design and construction of the sewer except that when construction is concurrent with road construction the sewer work may be incorporated into the Metropolitan Road contract. Costs are shared, with the Metropolitan Corporation assuming that part which is approved by the Department of Highways as eligible for roads subsidy.

Liaison With Department of Highways, Ontario - In previous Biennial Reports acknowledgement of the co-operation of Officials of the Department of Highways, Ontario, has been expressed, and it follows that a further expression of appreciation is recorded here.

A point of note is that in the eleven complete years of operation of the Department of Roads the Province of Ontario has contributed $132,294,814 to the Metropolitan Treasury on account of road development, improvement and maintenance.

A further interesting point is that, in 1963, of the $88,041,636 total authorized for road subsidy payments to Ontario municipalities by the Minister of Highways an amount of $20,753,825, or 24%, was paid to Metropolitan Toronto.

- WORKS UNDERTAKEN -

The schedule of works completed in 1963 and 1964 is as follows:

ELEVATED STRUCTURE	Mileage
1963	
Frederick G. Gardiner Expressway - Rees Street to York Street	.30 .04
1964	
Frederick G. Gardiner Expressway - York Street to Don River	1.83

STRUCTURES

1963

Don Mills Road Extension	Bridge over Don River at York Mills Road
Don Valley Parkway	C.P.R. over Don Valley Parkway north of Eglinton Avenue
- do. -	Wynford Drive over Don Valley Parkway north of Eglinton Avenue
"	Pedestrian Bridge over Royal Drive
Eglinton Avenue East	Overpass over C.N.R. at Bellamy Road
- do. -	Pumping Station at Bellamy Road
Kennedy Road	Subway under C.P.R. north of Macdonald-Cartier Freeway
Lawrence Avenue West	Subway under C.N.R. east of Keele Street
Sheppard Avenue East	Subway under C.P.R. in Agincourt
Spadina Road Extension	Bridge at Ranee Avenue
- do. -	Bridge at Yorkdale Road
"	Bridge - Lawrence Avenue over Spadina Road Extension
"	Bridge - Flemington Road over Spadina Road Extension

1964

Don Mills Road Extension	Bridge over Macdonald-Cartier Freeway		
Don Valley Parkway	Duke-Duchess Overpass over C.P.R., C.N.R., Don River and Don Valley Parkway		
Lawrence Avenue East	Arch Culvert at Curran Hall Creek		
Spadina Expressway	Bridge No.	6	- Macdonald-Cartier Interchange
- do. -	"	10	- do. -
"	"	16	"
"	"	17A	"
"	"	17B	"
"	"	18A	"
"	"	18B	"
"	"	19	"
"	"	20A	"
"	"	20B	"
"	"	21A	"
"	"	21B	"

Spadina Expressway	Underpass at Glencairn Avenue
Wilson Avenue	Subway under C.P.R. east of Weston Road
York Mills Road	Bridge over Don River

DRAINAGE STRUCTURES

1963

		Mileage
Spadina Road Extension	Storm Drain - Beechmount Avenue	.60

1964

Spadina Expressway	Storm Drain - Wilson Heights Boulevard to Don River	1.53
- do. -	Storm Drain - Macdonald-Cartier Freeway to Dresden Road	.97

NEW ROADS

1963

Don Valley Parkway	Eglinton Avenue to Lawrence Avenue	2.00

1964

Don Valley Parkway	Duke-Duchess Connection	2.00
- do. -	Bloor Street to Frederick G. Gardiner Expressway	1.50
Spadina Expressway	Lawrence Avenue to Yorkdale Road	0.69

PAVEMENT WIDENINGS

1963

Annette Street	Re-Alignment - Clendenan Avenue to Evelyn Avenue	0.16
Bayview Avenue	Eglinton Avenue to Blythwood Road	0.53
Dundas Street West	Chestnut Hills Crescent to St. Clair Place	1.52
Jane Street	Pelmo Crescent to Wilson Avenue	0.85
Kennedy Road	Lawrence Avenue to Ellesmere Road	1.14
Lawrence Avenue West	Dufferin Street to Keele Street	0.91
Markham Road	Lawrence Avenue East to 4000' south	0.75
Wilson Avenue	Epic Lane to Jethro Road	0.69

1964

Islington Avenue	Princess Margaret Drive to Dixon Avenue	1.46

EXISTING ROADS RECONSTRUCTED

1964

Bayview Avenue	York Mills Road to Sheppard Avenue	1.37
Danforth Road	Eglinton Avenue to Tansley Avenue	0.65

		Mileage
Eglinton Avenue West	300' west of Caledonia Road to Glenhaven Street	0.37
Kennedy Road	Ellesmere Road to Macdonald-Cartier Freeway including 400' south of Eglinton Avenue	0.44
Lawrence Avenue East	Blair Drive to Donway East	0.95
Lawrence Avenue West	Yonge Street to Bathurst Street	1.46
Victoria Park Avenue	Dawes Road to O'Connor Drive	1.29
Warden Avenue	300' north of Sylla Avenue to 200' north of Metropolitan Road, with intersectional improvement at Sheppard Avenue	0.87
Wilson Avenue	Walsh Avenue to Highway 400	0.54
- do. -	500' east of Avenue Road to 300' east of Bathurst Street	0.67
York Mills Road	Don Mills Road to 780' west of Woodbine Avenue	0.40

RESURFACING OF PERMANENT PAVEMENTS

1963

Dundas Street East	Don River to Broadview Avenue	0.20
Keele Street	Rogers Road to Lavender Road	0.20
- do. -	St. Clair Avenue to Annette Street.	0.60
Laird Drive	Eglinton Avenue to Millwood Road	0.80
Lake Shore Boulevard West	Mimico Avenue to Legion Road (Over T.T.C. Track Allowance)	0.60
Rogers Road	500' east of Weston Road to 200' east of Keele Street	0.30
St. George Street	Bloor Street to Dupont Street	0.60
Sheppard Avenue East	300' east of Woodbine Avenue to 400' west of Victoria Park Avenue	0.80
Woodbine Avenue	Finch Avenue to Ernest Avenue	0.60
Yonge Street	Donwoods Drive to York Mills Road	0.60
- do. -	Curb Lanes - Eglinton Avenue to City Limit	1.00

1964

Avenue Road	Oxton Avenue to City Limit	1.50
Dundas Street East	Jarvis Street to Parliament Street.	0.50
Kipling Avenue	Lake Shore Boulevard to New Toronto Street	0.40
Pape Avenue	Gerrard Street to C.N.R. Tracks	0.03
Woodbine Avenue	Finch Avenue to Steele's Avenue	1.00

INTERSECTIONAL IMPROVEMENTS

1963

Dufferin Street, at Finch Avenue
Eglinton Avenue East, at Brimley Road
- do. - at Rosemount Road
Islington Avenue, at Elmhurst Drive
Jane Street, at Foxwell Avenue

Jane Street, at Weston Road
Kingston Road, at Chine Drive
- do. - at Glen Everest Road
" at Guildwood Parkway
Lawrence Avenue East, at Curlew Drive
- do. - at Underhill Drive
Queen's Park Crescent, at Wellesley Street
Richview Side Road, at Kipling Avenue
- do. - at Royal York Road
Rexdale Boulevard, at Martin Grove Road
St. Clair Avenue East, at Birchmount Road
- do. - at Victoria Park Avenue

1964

Albion Road, at Calstock Avenue
- do. - at C.N.R. Bridge
" at Elmhurst Drive
" at Thistledown Boulevard
Bathurst Street, at Lawrence Avenue West
Danforth Road, east of Kennedy Road
- do. - at Midland Avenue
Dundas Street East, at George Street
Dundas Street West, at Old Dundas Street
- do. - at Scarlett Road
Eglinton Avenue East, at Birchmount Road
- do. - at Warden Avenue
Finch Avenue, at Yonge Street
Jarvis Street, at Isabella Street
Kingston Road, at Celeste Drive
Kipling Avenue, at Evans Avenue
- do. - at Horner Avenue
" at New Toronto Street
Lake Shore Boulevard West, at Jameson Avenue
Queen's Park Crescent, south of Bloor Street
The Queensway, at Royal York Road
- do. - at Stephen Drive
St. Clair Avenue East, at Kingston Road
Sheppard Avenue, at Yonge Street
Warden Avenue, at Lawrence Avenue East

MAJOR REPAIRS TO BRIDGES

1963

Bayview Avenue	North-bound at Lawrence Avenue
Eglinton Avenue East	Harvey C. Rose Bridge
Kingston Road	Highland Creek Bridge

1964

Bathurst Street	South of Front Street
Bloor Street East	Prince Edward Viaduct - Stage 2
Eglinton Avenue West	Over C.N.R. west of Caledonia Road

BRIDGE WIDENINGS

1963

Markham Road .... Cedarbrae Bridge

1964

Islington Avenue .... South of Dixon Road

EXISTING RETAINING WALLS RECONSTRUCTED

1964

Yonge Street, at Glengrove Avenue West.

~~xxxxxxxxxxx~~

- SUMMARY -

Works Completed	1963	1964
Elevated Structures	.30 .04 miles	1.83 miles
Structures	13	18
Drainage Structures	.60 miles	2.50 miles
New Roads	2.00 "	4.19 "
Pavement Widenings	6.55 "	1.46 "
Existing Roads Reconstructed	-	9.01 "
Resurfacing of Permanent Pavements	6.30 "	3.43 "
Intersectional Improvements	17	25
Bridges Repaired (Major Works)	3	3
Bridge Widenings	1	1
Retaining Walls Reconstructed	-	1

Works Under Construction, December 31, 1964

Elevated Structures	1.25 miles
Structures	1
New Roads	7.82 miles
Existing Roads - Reconstructed	1.90 "

- Compiled by Miss H. M. Meyrick

- SUMMARY OF EXPENDITURES -

Capital Projects	1963 $	1964 $
Annette Street, at Laws Street - Realignment	314,873	14,001
Avenue Road - Pavement Widening and Subway;		
Bloor Street to St. Clair Avenue	83,125	11,090 Cr.
Bathurst Street - Pavement Widening;		
Sheppard Avenue to Steele's Avenue	24,982	129,051
Bayview Avenue - Pavement Widening; and		
Lawrence Avenue Interchange;		
Blythwood Road to Steele's Avenue	234,371	458,016
Bloor and Dundas Street and Kipling Avenue (Six Points) Interchange	55,331	24,162
Danforth Road - Pavement Widening	-	112,967
Don Valley Parkway and Related Works:		
Bayview Avenue Extension	3,867	382,108
Carlton Street Connection to Bayview Avenue	19,882	6,863 Cr.
Don Valley Parkway	3,661,726	1,767,447
Duke-Duchess Connection	3,929,499	2,389,922
Lawrence Avenue East Extension	26,688	1,600
Don Valley Parkway Extension	19,570	148,096
Don Mills Road:		
Extension, York Mills Road to Steele's Avenue; and		
Grade Separation, C.P.R., north of Eglinton Avenue	1,461,562	1,255,259
Dixon Road - Widening;		
Highway 27 to Westerly Metropolitan Toronto Limit	70,295	310,395
Dufferin Street - Pavement Widening;		
Eglinton Avenue to Wilson Avenue	79,241	2,874
Dundas Street West - Pavement Widening;		
Old Dundas Street to Renown Road	760,402	356,132
Dundas Street West, Royal York Road and C.P.R. Grade Separation	1,984 Cr.	150
Eglinton Avenue East Projects:		
Extension from Laird Drive to Kingston Road	9	48,931
Grade Separation - C.N.R., Bellamy Road	1,178,949	21,756 Cr.
- do. - - C.N.R., Kennedy Road	68,328	65,600

Eglinton Avenue West Extension	-	340,010
Frederick G. Gardiner Expressway	16,917,489	11,367,208
Scarborough Extension of Frederick G. Gardiner Expressway	866,370	329,874
Finch Avenue - Widening;		
Bathurst Street to Dufferin Street	-	16,419
Islington Avenue Widening Projects	53,181	355,529
Jane Street;		
Grade Separations, C.N.R. and C.P.R., south of Trethewey Drive	346,849	49,811
Keele Street - Pavement Widenings;		
South Limit of North York to Sheppard Avenue	29,623	9,161
Bloor Street to Annette Street	-	1,892
Kennedy Road and Danforth Road - Pavement Widenings; Danforth Road to Steele's Avenue; and Danforth Avenue to Kennedy Road	876,382	307,804
Kipling Avenue;		
Grade Separation, C.P.R., south of Bloor Street	2,525	10,922
Lawrence Avenue East - Widening, Paving and Bridges: East City Limit to Bayview Avenue; Victoria Park Avenue to Kingston Road; and Donway East to Blaine Drive	133,117	1,123,661
Lawrence Avenue West, Scarlett Road and Dixon Road;		
Pavement Widening	120 Cr.	5,500 Cr.
Lawrence Avenue West - Widening;		
Yonge Street to Weston Road	1,249,545	966,127
Leslie Street - Widening;		
C.N.R. to Sheppard Avenue	-	3,304
Markham Road Projects:		
Widening and Bridges, Kingston Road to Macdonald-Cartier Freeway	253,939	322
Grade Separation at C.N.R., north of Eglinton Avenue	50,164 Cr.	48,237
Pape Avenue - Grade Separation at C.N.R., north of Gerrard Street	7,765	-
Pottery Road - Paving at Broadview Avenue	-	1,973
Prince Edward and Rosedale Viaducts - Repair	642,003	50,289

	1963 $	1964 $
The Queensway (Queen Street West Extension)	157 Cr.	13,970 Cr.
Richview (Eglinton) Expressway	7,036	108,557 Cr.
Rosedale Valley Road - Property	11,204	55,523
Sheppard Avenue West Bridge	551,456	30,438 Cr.
Sheppard Avenue East - Grade Separation, C.P.R., Agincourt	1,214,174	109,580
Spadina Expressway	4,053,444	6,025,081
Victoria Park Avenue - Widening and Bridges;		
Kingston Road to O'Connor Drive	21,926	398,427
Eglinton Avenue East to Sheppard Avenue	29,335	9,676
Warden Avenue - Paving; Sheppard Avenue to Ellesmere Road	-	225,671
Wilson Avenue - Widening; Avenue Road to Weston Road	508,122	1,657,356
York Mills Road - Widening; Don Mills Road to Woodbine Avenue	-	691,552
	39,715,760	31,423,946
Capital Projects on Former King's Highways, of which the Department of Highways, Ontario, assumed 100% of Costs		
Bloor Street West - Grade Separation, C.P.R., at Islington Avenue	77,301	1,825
Yonge Street - Pavement Widening and Bridge at Don River; North City Limit to Macdonald-Cartier Freeway	4,793	138,754
Total Capital Expenditures	39,797,854	31,564,525

Current Expenditures

Administration	414,529	432,983
Roadway Maintenance	1,821,743	1,880,624
Bridge Maintenance	248,022	546,205
Winter Maintenance	1,853,190	1,776,275
Cleaning Roads	14,554	20,825
Road Signs	12,182	11,798
Intersectional Improvements and Special Items	706,570	532,967
Lighting, Major Roads	53,181	82,447
Passenger Loading Platforms	4,280	1,757
Machinery and Equipment – Purchases	28,748	27,854
– do. – Operation and Maintenance	71,679	79,747
Storm Sewer Maintenance	–	117,017
Sundry – Including Yard Operation, Insurance, and Employees' Fringe Benefits	172,391	167,514
Survey of Capital Works	8,407	2,892
Total Current Expenditures	5,409,476	5,680,905

SUMMARY

Total Capital Expenditures	39,797,854	31,564,525
Total Current Expenditures	5,409,476	5,680,905
Total Expenditures, Gross	45,207,330	37,245,430

Subsidies and Contributions

Province of Ontario – Statutory Grants	21,330,916	17,290,456
Government of Canada – Railway Grade Crossing Elimination Fund	1,236,177	1,514,417
Railways and Area Municipalities	24,950	231,157
Total Subsidies and Contributions	22,592,043	19,036,030
TOTAL EXPENDITURES, NET	22,615,287	18,209,400

W. C. Goldwin, C.A.

- SUMMARY OF CONTRACTS AWARDED -

Contract No.	Detail Contractor ** Consultants	Project Engineers	Contract Amount $
1-63	Spadina Road Extension - Two Reinforced Concrete Bridges at Ranee Avenue and Yorkdale Road, including Lighting and Construction of Watermain and Sanitary Sewer Swansea Construction, Ltd. ** M. M. Dillon, Ltd.	K. M. Middleton	617,339
2-63	Spadina Road Extension - Lawrence Avenue to north of Yorkdale Road, and on Yorkdale Road, from Spadina Road Extension to Dufferin Street; Road Work and Retaining Walls, Sidewalks, Guide Railing, Fencing and Drainage Angus Robertson, Ltd. ** M. M. Dillon, Ltd.	K. M. Middleton	1,197,778
3-63	Eglinton Avenue East - Pumping Station at C.N.R. and Bellamy Road Ruliff Grass Construction Co., Ltd. ** Morrison, Hershfield, Millman and Higgins	T. H. Johnston	83,692
4-63	Don Valley Parkway - Interchange Extension to Duke and Duchess Streets, and Relocated Eastern Avenue, from Sumach Street to Lewis Street, overpassing C.N.R., C.P.R., Don River, Don Valley Parkway and Interchanging with the Parkway; Reinforced Concrete and Structural Steel Elevated Structure, Grading, Paving, Drainage and Lighting C. A. Pitts General Contractor, Ltd. ** Fenco-Harris	A. F. Allman	3,313,364 #
5-63	Various Roads (Outside City) - Permanent Asphalt Repair of Utility Road Cuts Evans Contracting Co., Ltd.	M. R. Browning	61,299
6-63	Don Valley Parkway - Pedestrian Bridge over Royal Drive H. J. Morgan Construction Co., Ltd.	A. F. Allman	42,001
7-63	Dundas Street East - Don River Bridge to Broadview Avenue; Resurfacing Johnson and Hogan Construction, Ltd.	A. P. H. French	24,034

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8-63	Frederick G. Gardiner Expressway - Service Cubicles under Elevated Section within the Canadian National Exhibition Grounds W. H. Dodd Construction Co., Ltd. ** A. D. Margison and Associates, Ltd. .... K. J. Gilbert	145,272
9-63	Eglinton Avenue East - Road Approaches to Subway under C.N.R. at Bellamy Road, including Extension of Adanac Drive from Bellamy Road to Mason Road; Excavation, Roadwork, Elevated Sidewalk, Drainage and Sodding Dufferin Construction Co. .... T. H. Johnston	252,764
10-63	Frederick G. Gardiner Expressway - York Street to Jarvis Street; Reinforced Concrete and Structural Steel Elevated Structure, and Reconstruction of Lake Shore Boulevard East-bound and West-bound McNamara Construction of Ontario, Ltd. ** Lakeshore Expressway Consultants .... K. J. Gilbert	6,756,667
11-63	Don Mills Road Extension - York Mills Road to Sheppard Avenue; Reinforced Concrete and Structural Steel Bridge over Highway 401 Harrison Construction (Ontario), Ltd. ** Ewbank, Pillar and Associates, Ltd. .... A. F. Allman	1,413,203 #
12-63	Prince Edward Viaduct - Repairs to Structural Steelwork and Painting Steed and Evans, Ltd. .... J. Watson	739,057
13-63	Keele Street - St. Clair Avenue West to Annette Street; Resurfacing Godson Contracting Co., Ltd. .... A. P. H. French	68,119
14-63	Spadina Road Extension - Wilson Heights Storm Trunk Drain, from Wilson Heights Boulevard to West Branch of Don River; Concrete-lined 9-foot Tunnel Drain and Outfall for distance of 7,500 feet and Relocation of 42-inch Sanitary Sewer Keystone Contractors, Ltd. ** M. M. Dillon and Co., Ltd. .... K. M. Middleton	1,706,453

# .... Contract not completed.
Award figure.

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15-63	Spadina Road Extension - Wilson Heights Storm Trunk Drain from Highway 401 to north of Dresden Road along Wilson Heights Boulevard; 100 feet of 54-inch, 1,300 feet of 66-inch, 2,000 feet of 84-inch, and 1,800 feet of 96-inch Concrete-lined Tunnel Drain, and 200 feet of 30-inch Open-cut Drain S. McNally and Sons, Ltd. ** M. M. Dillon, Ltd. .... K. M. Middleton	794,169
16-63	Lake Shore Boulevard West - Mimico Avenue to Legion Road; Resurfacing Dufferin Construction Co. .... A. P. H. French	46,588
17-63	Bayview Avenue - Eglinton Avenue East to Blythwood Road; Pavement Widening Rayner Construction, Ltd. .... T. H. Johnston	91,354
18-63	Don Valley Parkway - Slope Stabilization north from Beechwood Drive, including Precast Concrete Crib Walls Evans Contracting Co., Ltd. ** Fenco-Harris .... A. F. Allman	151,332
19-63	Laird Drive - Eglinton Avenue East to Millwood Road; Pavement Widening Dufferin Construction Co. .... A. P. H. French	69,156
20-63	Various Road - Improvements at nine Intersections and Resurfacing at three locations Crosstown Paving Co., Ltd. .... M. R. Browning	101,313
21-63	Yonge Street - Donwoods Drive to York Mills Road; Widening and Resurfacing Johnson and Hogan Construction, Ltd. .... M. R. Browning	70,432
22-63	Yonge Street - Various Locations between Eglinton Avenue and north City limit; Repairs to Curb Lanes Johnson and Hogan Construction, Ltd. .... M. R. Browning	90,769

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23-63	Markham Road - Lawrence Avenue to 4,000 feet southerly; Pavement Widening, including Cedarbrae Bridge Cook Paving Co., Ltd. .... J. L. Shirley	249,151
24-63	Kingston Road - Cleaning and Painting of Bridge over Highland Creek Eastern Painting and Decorating Co., Ltd. .... M. R. Browning	46,653
25-63	Eglinton Avenue East - Cleaning and Painting of Harvey C. Rose Bridge Kellar's Steeplejacks, Ltd. .... M. R. Browning	25,586
26-63	Bayview Avenue - Cleaning and Painting of North-bound Bridge over West Branch of Don River Lumb and Scotland, Ltd. .... T. H. Johnston	22,465
27-63	Not called.	
28-63	Frederick G. Gardiner Expressway - Jarvis Street to Don River; Handrail and Street Lighting, Sign Structures Bennett and Wright Contractors, Ltd. ** Lakeshore Expressway Consultants .... K. J. Gilbert	288,756
29-63	Kennedy Road - Lawrence Avenue to Ellesmere Road; and Ellesmere Road - East and West of Kennedy Road; Pavement Widening, including Sewer on Kennedy Road for Township of Scarborough Leo Contracting Co., Ltd. .... T. H. Johnston	469,995
30-63	St. George Street - Bloor Street to Dupont Street; Asphalt Resurfacing Johnson and Hogan Construction, Ltd. .... A. P. H. French	63,010
31-63	Winter Salting and Snow Plowing - Various Roads - South-East Division Miller Paving, Ltd. .... M. R. Browning	119,762
32-63	Winter Salting and Snow Plowing - Various Roads - North-East Division K. J. Beamish Construction Co., Ltd. .... M. R. Browning	104,964

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33-63	Winter Salting and Snow Plowing - Central and Expressway Division Evans Contracting Co., Ltd. M. R. Browning	96,661
34-63	Winter Salting and Snow Plowing - Various Roads - North-West Division K. J. Beamish Construction Co., Ltd. M. R. Browning	88,220
35-63	Winter Salting and Snow Plowing - Various Roads - South-West Division W. A. Ryder Paving, Ltd. M. R. Browning	92,803
36-63	Don Mills Road Extension - Sheppard Avenue to Van Horne Road; Roadwork, including Storm Sewers Miller Paving, Ltd. A. F. Allman	335,943
37-63	Annette Street - Clendenan Avenue to Evelyn Avenue; Realignment Raponi, Eastwood Paving and Construction, Ltd. J. G. Flint	77,258
38-63	Frederick G. Gardiner Expressway - Ramp Heating on Spadina Avenue Interchange Bennett and Wright Contractors, Ltd. ** Lakeshore Expressway Consultants K. J. Gilbert	14,017
39-63	Spadina Expressway - Structures Nos. 6 and 10 for Highway 401 Interchange Raney, Brady, McCloy, Ltd. ** M. M. Dillon, Ltd. K. M. Middleton	221,511
40-63	Bathurst Street - Repairs to Bridge south of Front Street; Replacement of Deteriorated Structural Steel, Concrete Roadway Deck and Sidewalks Ruliff Grass Construction Co., Ltd. J. Watson	243,186

1-64	Frederick G. Gardiner Expressway - Don River to Leslie Street; Reinforced Concrete and Structural Steel Elevated Structure, and Reconstruction of Lake Shore Boulevard East-bound and West-bound Harrison Construction (Ontario), Ltd. ** Lakeshore Expressway Consultants K. J. Gilbert	7,556,351 #

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2-64	Don Valley Parkway and Duke-Duchess Connection - Signs and Sign Support Structures South of Royal Drive .. Canada Electric Co., Ltd. ** Fenco-Harris .... A. F. Allman	37,920	
3-64	Wilson Avenue - Walsh Avenue to Wendell Avenue; Watermain and Sanitary Sewer for Proposed Grade Separation Donegal Construction Co. ** Duncan Hopper & Associates, Ltd. .... J. G. Flint	119,307	
4-64	Wilson Avenue Subway - Reinforced Concrete Flat-Slab Deck for Structure under C. P. R. Tracks; and Pavement Widening on Wilson Avenue - Highway 400 to Walsh Avenue, including Storm Drainage and Detour Road C. A. Pitts General Contractor, Ltd. ** Duncan Hopper & Associates, Ltd. .... J. G. Flint	1,271,610	
5-64	Spadina Expressway - Lawrence Avenue West to Wilson Avenue, including Highway 401 Interchange; Ten Reinforced Concrete Bridge Structures, Reinforced Concrete Retaining Walls and All Related Work Swansea Construction Co., Ltd. ** M. M. Dillon, Ltd. .... K. M. Middleton J. L. Shirley	2,856,079	#
6-64	Various Roads (Outside City) - Permanent Asphalt Repair of Utility Road Cuts Gazzola Paving, Ltd. .... M. R. Browning	83,824	
7-64	Lawrence Avenue East - Blaine Drive to Donway East; Asphaltic Concrete Pavement and Storm Drainage Cook Paving Co., Ltd. .... T. H. Johnston	410,418	
8-64	Frederick G. Gardiner Expressway - Jarvis Street to Don River; Asphaltic Paving on Elevated Structure Warren Bituminous Paving Co., Ltd. ** Lakeshore Expressway Consultants .... K. J. Gilbert	256,808	

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9-64	York Mills Road - Don Mills Road to West of Woodbine Avenue; Reinforced Concrete and Structural Steel Bridge over Don River and Related Roadwork Raney, Brady and McCloy, Ltd. ** Ewbank, Pillar and Associates, Ltd. A. F. Allman	668,234	#
10-64	Lake Shore Boulevard West and Kipling Avenue South - Repair of Sewer Cuts MacDonald Paving Company A. P. H. French	37,147	
11-64	Avenue Road - Oxton Avenue to North City Limit; Resurfacing Johnson and Hogan Construction, Ltd. A. P. H. French	182,391	
12-64	Don Valley Parkway - Slope Stabilization, Concrete Crib Wall and Alterations to Don Valley Drive Swansea Construction Co., Ltd. ** Fenco-Harris A. F. Allman	71,794	
13-64	Don Valley Parkway - Reconstruct and Extend Steiner Street to Dundas Street and Pave Adjacent Lanes Swansea Construction Co., Ltd. ** Fenco-Harris A. F. Allman	29,266	
14-64	Kennedy Road - 800 feet North of Ellesmere Road to Highway 401 and from Eglinton Avenue Southerly for 400 feet; Concrete Asphaltic Pavement Leo Contracting Co., Ltd. T. H. Johnston	187,151	
15-64	Yonge Street - Painting of Hogg's Hollow Bridge Harrison-Muir, Ltd. M. R. Browning	3,385	
16-64	Lake Shore Boulevard West - Painting of Bridge over Mimico Creek Harrison-Muir, Ltd. M. R. Browning	1,790	
17-64	Wilson Avenue - Avenue Road to Bathurst Street; Asphaltic Concrete Pavement and Intersectional Improvement at Avenue Road Johnson and Hogan Construction, Ltd. J. G. Flint	201,197	

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18-64	Danforth Road - Eglinton Avenue to Tansley Avenue; Asphaltic Concrete Pavement Warren Bituminous Paving Co., Ltd. T. H. Johnston	104,485	
19-64	Lawrence Avenue East - Prestressed Concrete Bridge over Highland Creek (The Willows) and Approaches from Susan Street to Overture Road; Concrete Arch Culvert at Curran Hall Creek; Creek Channelization, Storm and Sanitary Sewers, and Related Works Kilmer, Van Nostrand, Ltd. ** Morrison, Hershfield, Millman & Huggins J. L. Shirley T. H. Johnston	1,553,772	#
20-64	Victoria Park Avenue - Dawes Road to O'Connor Drive; Reconstruction of Pavement Dagmar Construction, Ltd. T. H. Johnston	339,018	
21-64	Spadina Expressway - Reinforced Concrete Underpass Structure at Glencairn Avenue and Approaches; Storm and Sanitary Sewer Relocation, Asphaltic Concrete Pavement, and All Related Work Swansea Construction Co., Ltd. ** M. M. Dillon, Limited K. M. Middleton J. L. Shirley	212,833	
22-64	Lawrence Avenue West - Yonge Street to Bathurst Street; Reconstruction Leo Contracting Co., Ltd. T. H. Johnston	580,113	
23-64	Various Roads - Intersectional Improvements John Cucci, Ltd. A. P. H. French	82,824	
24-64	Dundas Street East - Jarvis Street to Parliament Street; Resurfacing Johnson and Hogan Construction, Ltd. A. P. H. French	117,520	
25-64	Bayview Avenue - York Mills Road to Sheppard Avenue; Asphaltic Concrete Pavement and Storm Sewer Cook Paving Co., Ltd. T. H. Johnston	398,450	

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26-64	Islington Avenue - Princess Margaret Boulevard to South of Dixon Road; Pavement and Bridge Widening Johnson and Hogan Construction, Ltd. J. G. Flint	294,968	
27-64	Warden Avenue - Sylla Avenue to Metropolitan Road, and Scarden Avenue to Sheppard Avenue; Pavement Reconstruction, including Intersectional Improvement at Sheppard Avenue Leo Contracting Co., Ltd. J. G. Flint	230,276	
28-64	Albion Road - Replacement of Concrete Arch Culvert west of Islington Avenue and Extension of Concrete Culvert east of Kipling Avenue Baun and Cawker Construction, Ltd. M. R. Browning	26,531	
29-64	Yonge Street - Reconstruction of Concrete Retaining Wall, Sidewalk and Pavement north of Glengrove Avenue West Raney, Brady, McCloy, Ltd. M. R. Browning	41,400	
30-64	Spadina Expressway - Overpass at Wilson Avenue, Reconstruction of Wilson Avenue from Bathurst Street to Maniza Street, and Relocation of Wilson Heights Boulevard, from Wilson Avenue to Dresden Road - Four Reinforced Concrete Structures, Retaining Walls, Asphaltic Concrete Pavement, Sewers, and Relocation of 12" and 36" Watermains Swansea Construction Co., Ltd. ** M. M. Dillon, Ltd. J. L. Shirley K. M. Middleton	1,944,043	#
31-64	Eglinton Avenue West - Reconstruction of Pavement from Caledonia Road to Glenhaven Street, and Alteration to Bridge over C.N.R. John Cucci, Ltd. J. L. Shirley	139,150	
32-64	Spadina Expressway - Wilson Avenue Detour, from Faywood Boulevard to 1800 feet westerly Swansea Construction Co., Ltd. ** M. M. Dillon, Ltd. J. L. Shirley K. M. Middleton	46,082	

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33-64	Winter Salting and Snow Plowing - Various Roads - South-East Division Miller Paving, Ltd. M. R. Browning	166,216
34-64	Winter Salting and Snow Plowing - Various Roads - North-East Division Miller Paving, Ltd. M. R. Browning	135,948
35-64	Winter Salting and Snow Plowing - Various Roads - Central and Expressway Division Evans Contracting Co., Ltd. M. R. Browning	153,695
36-64	Winter Salting and Snow Plowing - Various Roads - North-West Division K. J. Beamish Construction Co., Ltd. M. R. Browning	114,711
37-64	Winter Salting and Snow Plowing - Various Roads - South-West Division W. A. Ryder Paving, Ltd. M. R. Browning	122,432

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